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TAXONOMIC OVERVIEW OF *STEMODIA* (SCROPHULARIACEAE) FOR SOUTH AMERICA

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ABSTRACT

A taxonomic study of the species of *Stemodia* occurring in South America is rendered. Twenty species are recognized as native within this region. These include *Stemodia angulata*, *S. durantifolia* (with two varieties, var. *durantifolia* and var. *chilensis*), *S. ericifolia*, *S. harleyi*, *S. hassleriana*, *S. hyptoides*, *S. lanceolata*, *S. latifolia* (?), *S. lobata*, *S. lobelioides*, *S. maritima*, *S. microphylla*, *S. palustris*, *S. pratensis*, *S. stellata*, *S. stricta*, *S. suffruticosa*, *S. trifoliata*, *S. veronicoides*, and *S. verticillata*. A key to species, descriptions, distributional maps, and complete synonymy for each of these is provided. Two new species, **S. harleyi** B.L. Turner and **S. stellata** B.L. Turner, are described and one new varietal combination, **Stemodia durantifolia var. chilensis** (Benth.) C. Cowan, is proposed.

KEY WORDS: Scrophulariaceae, *Stemodia*, South America

Turner & Cowan (1993) provided a taxonomic overview of the North American and Caribbean species of *Stemodia* (s.l.) for which seventeen species were recognized; only four of these are shared with South America (*S. angulata* Oerst., *S. durantifolia* [L.] Swartz, *S. maritima* L., and *S. verticillata* [Miller] Hassler). The present paper will account for the remainder of the species in the New World, sixteen of these confined to South America, four shared with North America, bringing to twenty the number of species recognized in South America. Altogether then, 29 species of *Stemodia* are currently known to occur in the New World. The Old World is estimated to contain about twenty species, most of these confined to Australia and Afroasia.

TAXONOMY

Stemodia L. (s.l.) 1759, *nom. conserv.*

Cordium Sloane 1707.

Erinus Miller 1731.

Stemodiacra P. Br. 1756.

Phaelypea P. Br. 1756.

Matourea Aublet 1775.

Adenosma R. Br. 1810, not *Adenosma* Nees.

Morgania R. Br. 1810.

Leucospora Nutt. 1834.

Chodaphyton Minod 1918.

Lendneria Minod 1918.

Valeria Minod 1918.

Verena Minod 1918.

Annual or perennial herbs, shrublets, or small scrambling shrubs to 3 m high. Leaves opposite or less often verticillate, simple to bipinnately dissected, mostly subpinnately veined. Flowers axillary, arranged (1-)2-4 to a node, often densely clustered along the upper stems forming well defined, usually interrupted, spikes. Sepals 5, ± alike, separate to the base or nearly so. Corollas mostly tubular, white to blue or violet, rarely somewhat yellowish, zygomorphic, lobes usually shorter than the tube, variously pubescent without and within, rarely glabrous, the inner surface near the throat of the tube usually bestowed with elongate hairs with spatulate apices. Anther bearing stamens usually 4, the thecae glabrous, not closely adjacent or parallel, usually separated by a swollen or enlarged connective, less often the thecae borne upon well developed stalks. Stylar shaft 2-10 times as long as the enlarged minutely bilobed stigmatic region, the latter usually reflexed, less often erect, or somewhat incurved, rarely markedly bilobed. Capsules ovoid, mostly somewhat longer than wide, glabrous, 4-valvate with usually loculicidal dehiscence. Seeds numerous, ellipsoid to broadly obpyramidal, deeply longitudinally 6-8 sulcate or not, usually to some extent stipitate and variously ornate. Base chromosome numbers, $x = 11$ and 14 (from only 3 species).

Type species, *Stemodia maritima* L.

KEY TO SPECIES

1. Habit of plant *Lycopodium*-like, the leaves small, ericoid, closely appressed and much-overlapping. ..... *S. ericifolia*

1. Habit of plant not at all as described in the above. ..... (2)

2. Calyx w/o basal bracteoles, the sepals clearly 5 (rarely 4). ..... (3)

2. Calyx bounded immediately beneath by 1-3 basal bracteoles, the latter usually appearing much like the sepals. ..... (11)

3. Leaves biternately dissected. ..... *S. hassleriana*

3. Leaves simple. ..... (4)

4. Annual rather delicate sprawling herbs mostly 10-20 cm high. .... *S. verticillata*

4. Perennial often suffruticose herbs mostly 20-150 cm high. ..... (5)

5. Leaves with stellate or branched hairs. ..... *S. stellata*

5. Leaves with simple unbranched hairs, stellate hairs absent. ..... (6)

6. Suffruticose brittle-stemmed herbs or shrublets mostly (0.5-)1.0-2.0 m high; Colombia, Ecuador, and Perú. ..... *S. suffruticosa*

6. Herbaceous-stemmed perennials mostly 0.3-0.5 m high, if suffruticose and higher then occurring in eastern Brazil, Guianas, and Venezuela. ..... (7)

7. Stigmatic region of stylar shaft erect and markedly 2-lobed. .*S. trifoliata*

7. Stigmatic region of stylar shaft variously recurved and not markedly 2-lobed. ..... (8)

8. Suffruticose herbs mostly 0.5-1.8 m high. ..... *S. pratensis*

8. Nonsuffruticose herbs 0.2-0.4 m high. ..... (9)

9. Corollas 5-7 mm long. ..... *S. angulata*

9. Corollas 14-18 mm long. ..... (10)

10. Pedicels mostly 10-20 mm long; sepals 4-5 mm long. .... *S. lobata*

10. Pedicels mostly 2.5-3.5 mm long; sepals 6-7 mm long. .. *S. harleyi*

11. Stems glabrous throughout or sparsely atomiferous-glandular at first but soon glabrescent. ..... (12)

11. Stems clearly persistently pubescent throughout, usually markedly so. . . . . (13)

12. Midstem leaves linear-lanceolate, glandular-punctate; plants mostly 20-50 cm high. ..... *S. palustris*

12. Midstem leaves oblanceolate, w/o glands or glandular punctations; plants mostly 50-100 cm high. ..... *S. lobelioides*

13. Corollas mostly 2.5-4.8 mm long, mostly obscured by the closely overlapping leaves or bracts. ..... *S. maritima*

13. Corollas 5-16 mm long, easily observed protruding from subtended leaves or bracts. ..... (14)

14. Pedicels mostly 10-25 mm long; sepals ovate, 1.5-4.5 mm wide, markedly anastomose-nervate. ..... (15)

14. Pedicels mostly 0-4 mm long; sepals linear-lanceolate 0.5-1.0 mm wide, weakly striate-nervate, if at all. ..... (16)

15. Sepals, at maturity, 6-10 mm long; corollas 14-16 mm long; coastal areas, eastern Brazil (Espirito Santo and Rio de Janiero). .... *S. veronicoides*

15. Sepals, at maturity, 5-6 mm long; corollas 11-13 mm long; Minas Gerais, Brazil. ..... *S. microphylla*

16. Corollas mostly 12-16 mm long. ..... *S. lanceolata*

16. Corollas mostly 5-11 mm long. ..... (17)

17. Plants stiffly erect, robust, mostly 80-150 cm high; corollas mostly 5-7 mm long; s Brazil, Paraguay, Uruguay. ..... *S. hyptoides*

17. Plants erect to sprawling, mostly 10-40(-50) cm high; corollas mostly 7-11 mm long. ..... (18)

18. Small annual-like (first year flowering?) or low rhizomatous herbs mostly 10-40 cm high; southernmost Brazil, Bolivia, Paraguay, Uruguay, and Argentina. ..... *S. stricta*

18. Stiffly erect or ascending very leafy herbs to 100 cm high; widespread weedy species but not in the above-named areas. .. *S. durantifolia*

Stemodia angulata Oerst., Vidensk. Meddel. Dansk. Naturhist. Foren. Kjobenharn 1853:22. 1854. *Stemodiacra angulata* (Oerst.) Kuntze, *Rev. Gen. Pl.* 2:466. 1891. TYPE: COSTA RICA. Cartago: "prope Cartago", w/o date, *Oersted 9472* (LECTOTYPE: C! [selected by Turner & Cowan 1993]; Photolectotypes: F!,GH!; Isolectotype: K!).

Stemodia ageratifolia C. Wright *in* Sauville, *Fl. Cubana* 99. 1873. *Stemodia angulata* Oerst. subsp. *ageratifolia* (C. Wright) Minod, Bull. Soc. Bot. Genève, ser. II, 10:191. 1918. *Lendneria ageratifolia* (C. Wright) Pennell, Proc. Acad. Nat. Sci. Phila. 75:13. 1923. TYPE: CUBA. Pinar del Río: along margin of arroyos, Luiz Lazo and Arroyo Hondo, 1860-1864, *Wright 2993* (HOLOTYPE: GH!; Isotypes: G!,GH!,MO!,NY,US!).

Stemodia jorullensis H.B.K. subsp. *reptans* Minod, Bull. Soc. Bot. Genève, ser. II, 10:190. 118. TYPE: NICARAGUA. Rivas: Ile de Omatepec, rues du village de Mayagulpa, 40 m, Oct 1869, *P. Levy 154* (HOLOTYPE: G-BOIS!; Isotypes: C!,G!).

Annual or short-lived perennial (?) herbs mostly 5-30 cm high. Stems erect at first, those at the lower nodes often procumbent, moderately crinkly-pilose with multiseptate hairs 1-2 mm long. Midstem leaves mostly 1.0-2.5 cm long, 0.7-1.5 cm wide; petioles 5-10 mm long; blades ovate to subdeltoid, subpinnately nerved, grading into the petioles, sparsely pilose, glandular-punctate beneath, the margins crenulodentate. Flowers axillary, arranged 1-3 at a node, the peduncles ebracteate, mostly 1-2 cm long, pubescent like the stems. Sepals mostly 4-5 mm long, pilose, one of these somewhat larger and broader. Corollas mostly 7-9 mm long, white or pinkish, the tubes glabrous or nearly so, the lobes 1-2 mm long, sparsely pubescent. Anther thecae ca. 0.6 mm long, glabrous, separated by a small globose connective. Capsule ovoid, 4-5 mm high, (3-)4-valvate, the apices recurved. Seeds ca. 0.5 mm long, stipitate, longitudinally sulcate with ca. 6-8 ribs.

DISTRIBUTION (Figure 1): México (Chiapas), Cuba, Central America, and northwestern South America, 100-1000 m; flowering all seasons.

REPRESENTATIVE SPECIMENS: SOUTH AMERICA: COLOMBIA: Bolívar: Frasquillo, on Río Sinu, 20-100 m, 5-6 Mar 1918, *Pennell 4192* (C,K). El Valle: Cisneros, 300-500 m, 5 May 1939, *Killip 35615* (F,PH,US).

ECUADOR: Esmeraldas: Playa de Oro, Jul-Aug 1924, *Thomas L30* (K). Los Rios: 14 km SE of Quevedo, 75 m, 22 Feb 1972, *MacBryde 1122* (MO).

PERU: Amazonas: Labanda, Huampami, Río Cenepa, Chacra, 600-700 ft, 3 Aug 1974, *Ancuash 712* (F,MO,TEX).

Stemodia durantifolia (L.) Swartz

This is an extremely weedy widespread species, as noted in more detail below. We recognize two varieties, as follows:

1. Corollas mostly 9-11 mm long; stems with predominantly crinkly hairs, among these intermixed glandular hairs; Chile. ..... var. *chilensis*

Figure 1. Distribution of *Stemodia angulata*.

1. Corollas mostly 5-8 mm long; stems variously pubescent, but mostly glandular-pubescent; widespread. ..... var. *durantifolia*

Stemodia durantifolia (L.) Swartz var. *durantifolia*. BASIONYM: *Capraria durantifolia* L., *Syst. Nat.* ed. 10 1116. 1759 (May-Jun). *Stemodia durantifolia* (L.) Swartz, *Obs. Bot.* 240. 1791. *Stemodiacra durantifolia* (L.) Morong, *Pl. Coll. Paraguay* 183. 1880-1893. According to D'Arcy (1979), and we agree, this name is based upon *Lysimachia coerulea galericulata* ...Sloane, *Cat. Pl. Jamaic.* 66. 1696 (LECTOTYPE: BM! [selected by Turner & Cowan 1993]).

Capraria oppositifolia L., *Fl. Jamaic.* 380. 1759.

Stemodia erecta (P. Br.) Minod, Bull. Soc. Bot. Genève, ser. II, 10:212. 1918. TYPE: JAMAICA. According to D'Arcy, with whom we agree, this name is based, in part, upon *Phaelypea erecta*; *foliis sessilibus* ...R. Br. (LECTOTYPE: BM! [selected by Turner & Cowan 1993]). Browne also cited *Lysimachia coerulea galericuta* ...Sloane, which has been selected as the lectotype for *Capraria durantifolia* L., as noted above.

Conobea verticillaris Spreng., *Novi Prov. Hort. Acad. Hal.* 13. 1818. *Stemodia verticillaris* (Spreng.) Link, *Enum. Pl. Hort. Berol.* 2:144. 1822. TYPE: BRASIL. from material cultivated in the Berlin Botanical Garden (HOLOTYPE: B [destroyed]; Photoholotypes: G!,GH!,MO!; Isotype: LE!).

Scrophularia subhastata J. Velloso, *Fl. Flumin.* 6: t. 88, 264. 1827. *Stemodia subhastata* (Vell.) Benth. *in* DC., *Prodr.* 10:381. 1846. *Stemodiacra subhastata* (Vell.) Kuntze, *Rev. Gen. Pl.* 2:466. 1891. TYPE: BRASIL. "prope Rio de Janeiro", 1782-1789, *Velloso s.n.*? (LECTOTYPE: K! [selected by Turner & Cowan 1993]). The lectotype is w/o collector but is said to be from "Rio Jan" in what is thought to be the script of Velloso.

Stemodia ehrenbergiana Schlecht., Bot. Zeit. 1:169. 1843. TYPE: MEXICO. Grown from seeds in 1842 provided by Ehrenberg, probably from Veracruz (HOLOTYPE: HAL, not located). The taxon was originally compared with *S. durantifolia*, otherwise it is essentially without description.

Stemodia berteroana Benth. *in* DC., *Prodr.* 10:384. 1846. *Stemodiacra berteroana* (Benth.) Kuntze, *Rev. Gen. Pl.* 2:466. 1891. TYPE: DOMINICAN REPUBLIC [Hispaniola]. *Bertero s.n.* (HOLOTYPE: K [not located]; Isotype: M!; Photoisotypes: F!,GH!,MO!).

Stemodia durantifolia (L.) Swartz var. *angustifolia* Griesb., *Fl. Br. West Ind.* 429. 1861. TYPE: JAMAICA. w/o locality, 1858, *March 826*

(LECTOTYPE: K! [selected by Turner & Cowan 1993]). Griesbach described this taxon as being densely pubescent and devoid of eglandular hairs, the leaves linear-lanceolate and tapering nearly to the base, such as found on the lectotype and which bears the handwritten notation, */beta angustifolia.* On the same sheet is mounted the typical form of the species.

Stemodia arizonica Pennell, Not. Nat. Acad. Nat. Sci. Phil. 43:3. 1940. TYPE: UNITED STATES. Arizona: Pima Co., by streams of the Santa Catalina Mts., 2000-3000 ft, 11 Apr 1881, *C.G. Pringle s.n.* (HOLOTYPE: PH!; Isotypes: F!,G-DC!,GH!,MICH!,MO!,US!, WIS!).

Stemodia bissei Tsvelev, Bot. Zh. (Leningrad) 72:1662. 1987. TYPE: CUBA. Prov. Pinar del Río: Matahambre, Halas Aguas, Monte al Fote de la desembocadura del Río Malas Aguas, 28 Mar 1982, *J. Bisse et al. s.n.* (HOLOTYPE: HAJB).

Erect mostly perennial viscid herbs 20-100 cm high. Stems usually stiffly erect or ascending, variously pubescent with either pilose eglandular or glandular hairs 1-2 mm long, or both, below these a more uniform vestiture of short glandular hairs 1 mm long or less, sometimes only short-glandular hairs are found. Midstem leaves 2 or 3 to a node, sessile, mostly 2-7 cm long, 0.5-2.0 cm wide, usually clasping at the base, pinnately nerved, glandular-pubescent on both surfaces, the margins serrate. Flowers 2-4 at a node, axillary, usually forming pronounced terminal bracteate interrupted spikes, the pedicels usually less than 1 mm long, but occasionally up to 8 mm long. Sepals 3-5 mm long, ± alike, variously pubescent, subtended by 1 or 2 basal bracts as long as or somewhat longer than the sepals. Corollas blue to purplish, minutely pubescent, mostly 5-8 mm long, the lobes 1-2 mm long. Anther thecae ca. 0.5 mm long, separated by a globose connective. Capsule ovoid, 4-5 mm long, 4-valvate, their apices somewhat dorsally arcuate. Seeds ellipsoid, ca. 0.3 mm long, weakly 5-ribbed at best, pedicellate, bearing minute well-separated warts in longitudinal lines.

DISTRIBUTION (Figure 2): A weedy species found throughout much of the tropical and subtropical regions of the New World, extending into the drier more temperate regions of western North and South America from California, U.S.A., to Brazil and Perú; recent introductions also occur elsewhere; flowering all seasons.

Minod (1918) treated *Stemodia durantifolia* within his concept of *S. erecta*, not appreciating or being aware of the priority of the former name. D'Arcy (1979) has treated in some detail most of the nomenclature accounted for in the above. He did not, however, distinguish var. *chilensis.*

Stemodia durantifolia is an exceedingly variable species and its separation into the two varieties recognized here is largely based upon the geographical

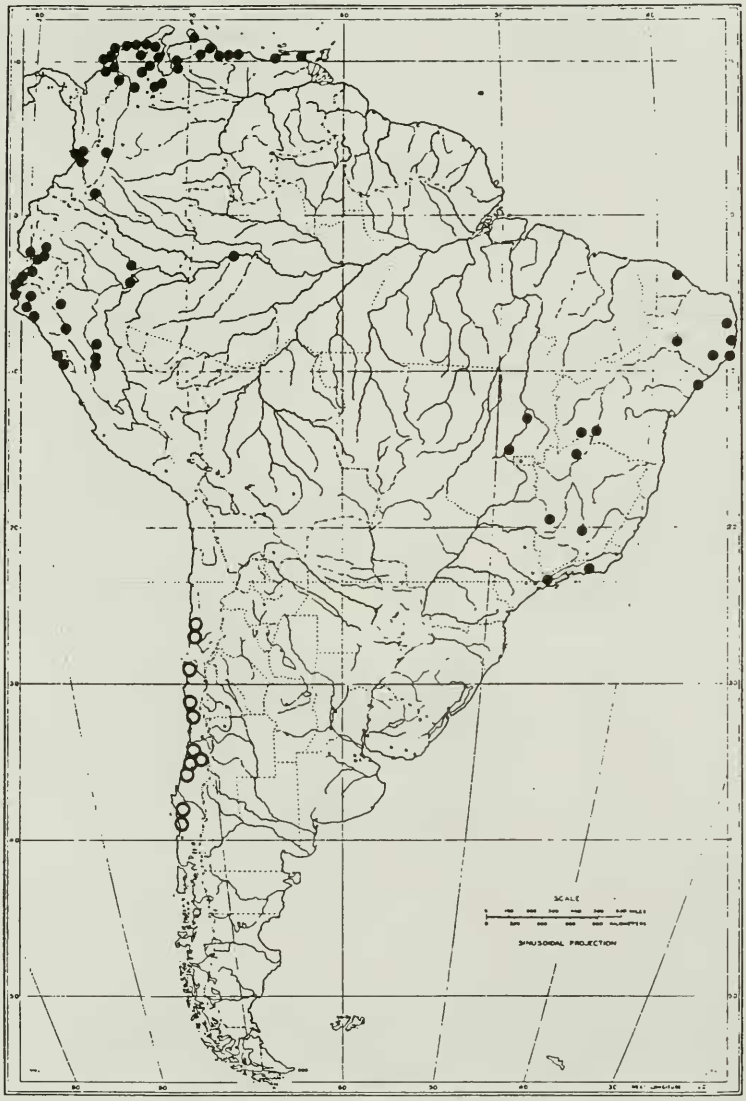

Figure 2. Distribution of *Stemodia durantifolia* in South America: var. *durantifolia* (solid circles); var. *chilensis* (open circles).

isolation of Chilean populations having larger corollas and more often verticillate leaves than occur elsewhere. Because of the 1000 or more sheets examined, we have much-abbreviated the list of cited collections. The distribution of *S. durantifolia* in North America and the West Indies is figured in Turner & Cowan (1993).

REPRESENTATIVE SPECIMENS: BRASIL. Amazonicas: *Spruce 3858* (G-DC,MO,OX). Ceara: *Drovet* (GH,MICH,PH). Goias: *Macedo 3961* (RB). Minas Gerais: *Glaziou* (G). Guanabara: *Glaziou 14191* (G). Paraiba: *Goncalves s.n.* (RB). Pernambuco: *Gardner 1092* (F,G).

COLOMBIA. Atlantico: *Dugand 5488* (UC). Bolívar: *Pennell 4729* (US). Del Huila: *Fosberg 19346* (US). Del Norte: *Killip 20933* (US). El Valle: *Killip 35616* (PH,US). Magdalena: *Pennell 10986* (PH). Santa Marta: *Smith 1360* (F,G-DC,LL,MICH,MO,PH,TEX,UC,US).

ECUADOR. El Oro: *Steyermark 54088* (F). Guayas: *Mille s.n.* (PH). Los Rios: *Dodson 7046* (MO).

PERU. Amazonas: *Barbour 4374* (MO). Cajamarca: *Woytkowski 6859* (MO). La Libertad: *Hudson 1023* (MO). Lambayeque: *Cerrate 5276* (MO). Loreto: *McDaniel 23213* (F). Piura: *Sagástegui 10924* (F). San Martín: *Belshaw 3192* (F,LL). Tumbes: *Simpson 580* (US).

VENEZUELA: Aragua: *Vogl 1345* (M). Lara: *Steyermark 56833* (F,PH). Merida: *Reed 658* (US). Sucre: *Steyermark 57652* (F,PH).

Stemodia durantifolia (L.) Swartz var. *chilensis* (Benth.) C. Cowan, *comb. nov.* BASIONYM: *Stemodia chilensis* Benth., Edward's Bot. Reg. 1470. 1831. *Stemodiacra chilensis* (Benth.) Kuntze, *Rev. Gen. Pl.* 2:166. 1891. TYPE: CHILE. w/o locality, 1829, *McRae s.n.* (LECTOTYPE: K! [selected here]). The lectotype is mounted on a sheet with 3 other collections *Zuccarina s.n.*, *Meyen s.n.*, and *Bridges s.n.*), all more or less typical of *Stemodia durantifolia* var. *chilensis* as conceived of here.

Erect mostly perennial viscid herbs 20-80 cm high. Stems pilose with crisp glandular or eglandular spreading hairs 0.5-1.5 mm long. Midstem leaves commonly 3 or 4 to a node, 3-5 cm long, 1.0-1.8 cm wide, sessile, subpinnately nerved, glandular-pubescent, the surfaces atomiferous-glandular, the margins serrate. Flowers axillary, mostly arranged 2-4 at a node along the upper 1/3 of the stems in interrupted bracteate spikes, the pedicels 1-3(-8) mm long. Sepals ± alike, mostly 5-7 mm long, glandular-pubescent, bounded by 1 or 2 somewhat larger but similar basal bracts. Corollas mostly 9-11 mm long, bluish-purple, markedly 2-lipped, minutely sparsely pilose, the lobes 2-4 mm long. Anther thecae ca. 0.6 mm long, purple, separated by a globose connective. Capsules ovoid, 3.5-5.0 mm long, 4-valvate, the apices somewhat apically arcuate. Seeds ellipsoid, ca. 0.3 mm long, stipitate, ornamented with minute warts arranged in 6 or more parallel lines.

DISTRIBUTION (Figure 2): known only from central Chile occurring in semiaquatic habitats, 50-800 m; flowering December-February.

This taxon has been variously recognized as either a good species or synonymized under *Stemodia durantifolia* (*e.g.*, D'Arcy, 1979). Since the populations concerned are readily distinguished from more typical plants elsewhere by their larger corollas (9-11 mm long vs. 5-8 mm), more frequently whorled leaves, and longer pedicels, we opt to retain the taxon, but at the varietal level. Plants grown from seed in the greenhouse by the junior author (*Cowan 4262*, TEX) became quite lank but showed the large corollas characteristic of the taxon. The variety is well illustrated by Bentham in his original description from material grown in the greenhouse.

Stemodia durantifolia is closely related to *S. hyptoides* Cham. & Schlecht. and *S. stricta* Cham. & Schlecht. and these might be treated, unwisely we think, as but varieties of a much-enlarged *S. durantifolia*. Indeed, *S. stricta* was treated as a widespread populational variety of *S. hyptoides* by Dawson (1979), but both of these taxa might with equal validity be positioned within an enlarged *S. durantifolia*. While *S. hyptoides* can usually be distinguished from the latter by its robust habit, large thick leaves, and densely pilose, mostly eglandular vestiture, it is often difficult to distinguish autumnal forms of *S. stricta* from *S. durantifolia*, which probably accounts for occasional reports (and annotations) of the latter taxon from Argentina, Uruguay, and Paraguay, all of which we believe are better positioned in *S. stricta*, the latter being in its typical form a more delicate plant than *S. durantifolia*, with larger, more apically flaring corolla lobes.

REPRESENTATIVE SPECIMENS: CHILE. Atacama: Vallenar, Alto del Carmen, ca. 800 m, Dec 1923, *Wederman 163* (BM,CAS,F,GH,MO,UC). Cautin: Tenuco, Jan 1920, *Claude-Joseph 1060* (US). Coquimbo: Elqui, 30 km W of Vicuna, 400 m, 5 Dec 1939, *Wagenknecht 18496* (F,LIL,MO,UC). Curico: Llico, Dec 1861, *Philippi s.n.* (PH). Malleco: shore of Río Malaleco, 100-150 m, 27-28 Feb 1925, *Pennell 12844* (BM,F,PH). Santiago: near Santiago, swampy area along Río Colorado, 2000 ft, 4 Feb 1902, *Hastings 338* (UC,US). Talca: El Picayo, E of Talca, 26 Dec 1936, *Barros 140* (GH). Valparaiso: Vina del Mar, 50 m, 10 Dec 1938, *Morrison 16833* (MO,SI,UC).

Stemodia ericifolia (Kuntze) K. Schumann, Just's Jahresb. 26:395. 1898. BASIONYM: *Stemodiacra ericifolia* Kuntze, *Rev. Gen. Pl.* 3(2):239. 1898. *Chodaphyton ericifolium* (Kuntze) Minod, Bull. Soc. Bot. Genève 10:236. 1918. TYPE: PARAGUAY. Puerto Esperanza, Sep 1892, *O. Kuntze 6732.* (LECTOTYPE: NY [selected here]; Isolectotype: M!; Possible photoisolectotypes: F!,GH!,MO!). At our request, Noel Holmgren vouchered the existence of the NY lectotype.

Stemodia ericifolia (Kuntze) K. Schumann subsp. *vera* Hassler, Fedde

Rep. Nov. Sp. 8. 210. 1910. TYPE: PARAGUAY. Alto Paraguay: Gran Chaco, Puerto Talavera, Aug 1907, *K. Friebrig 1228* (LECTOTYPE: G! [selected here]; Photolectotype: F!; Isotypes: G [4 sheets]!).

Perennial stoloniferous herbs 5-20 cm high. Stems mostly glabrous to minutely sparsely pubescent, more or less 4-sided, internodes very short, much-overlapped by the leaves. Midstem leaves acicular, mostly 4 to a node (rarely 5-8), 6-15 mm long, 0.5-1.0 mm wide, 1-nervate, hispidulous, overlapping, the stems superficially resembling a club-moss. Flowers axillary, mostly 1 to a node, the peduncles 0.1-3.0 mm long. Sepals 5, mostly 3-4(-5) mm long, all alike, minutely pubescent, sharply acute, the margins ± scarious, below these 2 similar but somewhat longer basal bracts. Corollas mostly 9-11 mm long, pubescent, bluish-violet, glandular-pubescent throughout, the lobes 3-4 mm long. Anther thecae ca. 0.5 mm long, separated by a globose connective. Stigmatic portion of style erect, 2-lobed. Capsule ovoid, 2.5-3.5 mm high, 4-valvate, the apices erect. Seeds broadly obpyramidal ca. 0.3 mm long, pedicellate, weakly 6-ribbed, if at all, the surfaces smooth.

DISTRIBUTION (Figure 3): Paraguay and closely adjacent Argentina and Bolivia.

This is an exceedingly distinct species, readily separated from other species of *Stemodia* by its habit. Minod (1918) treated it as the only member of the genus *Chodaphyton*. Nevertheless it has the syndrome of characters which define *Stemodia* and we so retain it here.

Hassler established subsp. *vera*, distinguishing this from subsp. *ericifolia* by its narrower, 5-7 verticillate, leaves (vs. 4) and smaller corollas (ca. 8 mm long vs. 9-11 mm). We find these to be variable characters.

REPRESENTATIVE SPECIMENS: ARGENTINA. Chaco: Colonia Benitez, Jul 1946, *Schulz 6062* (CTES). Corrientes: San Cosme, Costa Toledo, 17 Oct 1965, *Krapovickas 11584* (CTES). Formosa: 5 km E of Capitan J. Page, 20 Nov 1978, *Renovize 3545* (DAR,K). Salta: Oran, Embarcación, 22 Feb 1940, *Schreiter 11217* (GH). Santa Fe: Plan Matriz, 55 km del limite con Sge. del Estere, 1 Dec 1981, *Rosario 3476* (SI).

BOLIVIA. Cordillera: Santa Cruz, El Limón, 9 Jun 1908, *Asp s.n.* (SI).

PARAGUAY. Boquerón: Puerto Casado and vicinity, 19 Oct 1956, *Pederson 4094* (C,US). Chaco: Puerto Cascado, Dec 1916, *Rojas 1858* (SI). Olimpo: Puerto Diana, 6 km from Bahía Negra, 8 Jan 1974, *Arenas 330* (CTES).

Stemodia harleyi B.L. Turner, *sp. nov.* TYPE: BRASIL. Bahia: Mucugé, ca. 5 km along Andaraí road, wet ground on rock ledge by spring (41°20'W, 12°58'S), ca. 900 m, 25 Jan 1980, *R.M. Harley et al. 20667* (HOLOTYPE: CTESN!).

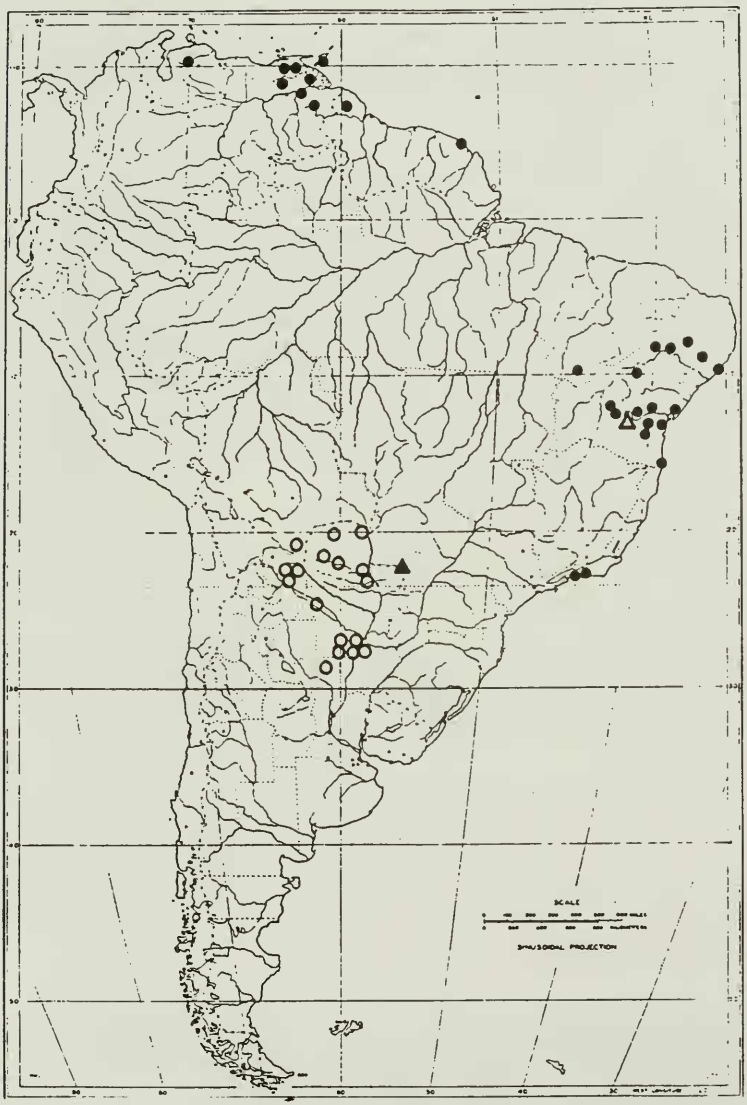

Figure 3. Distribution of *Stemodia ericifolia* (open circles); *S. foliosa* (closed circles); *S. harleyi* (open triangles); *S. hassleriana* (closed triangles).

Stemodiae damazianae Beauv. similis sed differt caulibus omnino dense longivillosis trichomatibus eglandulosis plerumque 1-2 mm longis (vs. omnino breviglandulosis trichomatibus plerumque 0.1-0.2 mm longis) et pedicellis 2.5-3.5 cm longis (vs. 1-2 cm longis).

Suffruticose perennial herbs 30 cm high. Stems terete, densely villous with spreading hairs 1-2 mm long. Midstem leaves mostly 3-5 cm long, 1.5-2.5 cm wide; petioles 6-10 mm long; blades 2-3 to a node, broadly ovate, moderately villous, drying black, subpinnately nervate, sparsely glandular-punctate beneath, the margins coarsely crenulodentate. Flower axillary, arranged 1 or 2 to a node, the pedicels 2.5-3.5 cm long, ebracteate, pubescent like the stems. Sepals 5, ± alike, 6-7 mm long, linear-lanceolate, villous, w/o basal bracts. Corollas ca. 14 mm long, reportedly blue, the throat glabrous or nearly so without, the interior portion densely white-villous, the lobes 3-4 mm long, broadly rounded. Anther thecae ca. 0.6 mm long, separated by a swollen connective and each shortly stalked. Capsule broadly ovate, 5-7 mm high, 4-valvate, the valves obtuse and erect apically. Seeds ca. 1 mm long ovoid, 6-8 striate, ornate (as in a peanut shell).

DISTRIBUTION (Figure 3): Known only by the type.

This taxon superficially resembles *Stemodia veronicoides* J.A. Schmidt *in* Martius but lacks the pedicellate bracts and reticulate-nervate sepals of that species. It is actually much closer to the bracteate *S. damaziana*, from which it is readily distinguished by its larger leaves, villous vestiture (vs. minutely glandular-pubescent) and longer pedicels (2.5-3.5 cm long vs. 1-2 cm).

It is a pleasure to name this taxon for Dr. Raymond Harley of Kew Gardens who participated in its discovery.

Stemodia hassleriana Chodat, Bull. Herb. Boiss., ser. II, 4:383. 1904. *Verena hassleriana* (Chodat) Minod, Bull. Soc. Bot. Genève, ser. II, 10:249. 1918. TYPE: PARAGUAY. Amambay: "in argillosis humidis in regione cursus superioris fluminis Apa, Nov 1901-1902, *Hassler 7747* (HOLOTYPE: G-DEL!; Photoholotypes: F!,GH!,MO!; Isotypes: C!,G!,GH!,K!, MICH!,MO!,UC!).

Perennial herbs 20-40 cm high. Stems stiffly erect, 4-5 angled, minutely glandular-pubescent to glabrescent. Leaves biternately dissected, mostly 2-3 cm long, 2-3 cm wide; petioles 0.8-8.0 mm; the ultimate segments narrowly lanceolate to linear-lanceolate, minutely scabridulous to glabrous. Flowers axillary, arranged 2-4 at a node, the peduncles ebracteate, 1-5 mm long. Sepals mostly 5-6 mm long, all alike, linear-lanceolate, the margins scarious. Corollas irregularly campanulate, glabrous, ca. 5 mm long, ca. 5-6 mm wide, blue, the tube ca. 3 mm long, the lobes broadly rounded, ca. 2 mm long. Anther

thecae glabrous, ca. 6 mm long, nonparallel, separated by a short connective or somewhat stalked. Capsules 4-5 mm high, ovoid, 4-valvate, their apices erect, the style persisting in fruit, the stigmatic area enlarged but not especially recurved. Seeds broadly obpyramidal, ca. 0.5 mm long, stipitate, ornamented with about 8 longitudinal ridges, the latter striate along their flanks.

DISTRIBUTION (Figure 3): Paraguay, known only by collections from or near the type locality; flowering November-May.

REPRESENTATIVE SPECIMENS: PARAGUAY. Amambay: Bella Vista, Potrero (antes selva), ca. del Río Apay Col. Sargento Duré, 15 Dec 1983, *Cowan 4170* (TEX; widely distributed elsewhere); 8 km S of Bella Vista, 16 May 1974, *Schinini 9026* (COR); San Salvador, Mar 1917, *T. Rojas 2404* (LIL).

Minod (1918) treated this taxon as the only member of his newly erected genus, *Verena*. The latter was said to differ from *Stemodia* (s.s.) by its conical or enlarged corollas tubes (vs. cylindrical), nonflaring stigmatic area, and dissected leaves. We find, however, that the stigmatic portion of the style, even in type material, enlarges with age, much like the other taxa, although it does not recurve. The most striking feature of this species is its triternately dissected leaves which approach those of *Leucospora multifida* (Michaux) Nutt.

Stemodia hyptoides Cham. & Schlecht., Linnaea 3:8. 1878. *Stemodiacra hyptoides* (Cham. & Schlecht.) Kuntze, *Rev. Gen. Pl.* 2:466. 1891. TYPE: BRASIL. "copiosam legit Sellow" "Brazilia meridionalis, Oct 1821, *Sellow s.n.* (LECTOTYPE: B! [selected here]; Isolectotypes: B!,HAL!,K!, LE!; Photoisolectotypes: F!,GH!,MO!). We have selected as lectotypes from among many possible collections by Sellow, only those sheets with his handwritten notation "Brazilia meridionalis", as mentioned in the protologue.

Stemodia hyptoides Cham. & Schlecht. var. *platensis* Benth. *in* DC., *Prodr.* 10:384. 1846. TYPE: ARGENTINA. La Plata, w/o date, *Tweedie s.n.* (HOLOTYPE: K!).

Stemodia hyptoides Cham. & Schlecht. var. *auriculata* Chodat & Hassler, Bull. Herb. Boiss., ser. II, 4:287. 1904. TYPE: PARAGUAY: "camapo pr. Patino" Oct 1885-1891, *E. Hassler 1289* (LECTOTYPE: G! [selected here]; Photolectotypes: F!,GH!; Isolectotype: K!).

Stemodia pilcomayensis Minod, Bull. Bot. Soc. Genève, ser. II, 10:195. 1918. TYPE: PARAGUAY. ARGENTINA: "in regione inferiorus fluminis Pilcomayo" [Comisión argentine-paraguaya de limites

1906]", "campos bajos campto VI", Jun 1906, *T. Rojas 251* (HOLOTYPE: G!; Photoholotypes: F!,GH!,MO!; Isotype: G!). Since the two sheets at G have attached to them essentially identical plants we have recognized one of these as the holotype, the other as isotype.

Stemodia orbiculata Minod, Bull. Bot. Soc. Genève, ser. II, 10:223. 1918. TYPE: URUGUAY. "Vera, in locis humidis", 2 Jan 1903, *M.B. Berro 3150* (HOLOTYPE: G-BOIS!; Isotype: G-BOIS!).

Stiffly erect robust perennial herbs mostly 0.8-1.5 m high. Stems, near the base, 10-15 mm across, 4-5 sided, densely pubescent throughout with crinkly multiseptate hairs. Midstem leaves mostly 5-8 cm long, 1.5-3.0 cm wide, sessile, clasping-auriculate at base, subpinnately nervate, ovate to ovate-elliptic, pubescent like the stems, the undersurfaces glandular-punctate, the margins serrulate. Flowers arranged 2-4 at a node in terminal bracteate interrupted spikes, the pedicels mostly 0-2 mm long. Sepals 5, ± all alike, 5-6 mm long, linear-lanceolate, glandular-pubescent, bounded beneath by 1 or 2 similar but somewhat narrower basal bracts. Corollas mostly 5-7 mm long, pubescent, the lobes 1-2 mm long, the tube with or without villous hairs within. Anther thecae ca. 0.5 mm long, separated by a globose connective. Capsules ovate, 4-6 mm high, 4-valvate, the valves erect. Seeds ovoid, ca. 0.5 mm long, stipitate, minutely warty.

DISTRIBUTION (Figure 4): southern Brazil, Paraguay, Uruguay, and Argentina, mostly along coastal areas in heavy alluvial soils, 10-300 m; flowering mainly November-March.

Stemodia pilcomayensis appears to be a robust form of *S. hyptoides* showing characters of *S. lanceolata* Benth. *in* DC., and might possibly be a hybrid or hybrid derivative from between these taxa. *Stemodia orbiculata* appears to be a form of *S. hyptoides* with blades broadly ovate to somewhat orbicular.

Stemodia hyptoides is closely related to *S. durantifolia* and appears to replace that species from southern Brazil southward. Its spatial relationship, and possible intergradation with yet other taxa are briefly discussed under *S. lobelioides* Lehmann.

REPRESENTATIVE SPECIMENS: ARGENTINA. Buenos Aires: Delta del Paraná, 26 Mar 1937, *Burkhart 8360* (TEX). Chaco: Colonia Benitez, 55 m, 18 Jan 1941, *Meyer 3633* (GH,US). Corrientes: Concepción, Río Santa Lucia, 5 Feb 1968, *Krapovickas 13781* (LL). Entre Rios: Puerto Constanza, 21 Mar 1940, *Burkhart 10540* (TEX). Formosa: Pilcomayo, Buena Vista, 2 Dec 1948, *Morel 6673* (TEX). Misiones: Apostoles, 23 Mar 1977, *Cabrera 28309* (TEX). Salta: Oran, Río Posado, 16 Sep 1938, *Cabrera 4602* (GH,US). Santa Fe: General Obligado, Villa Ocampo, costa del Río Paraná Mini (San Vicente), 20 Jan 1974, *Quarin 1903* (CTES). San Martín: Santo Tome, 5 Feb 1972, *Krapovickas 20593* (F,GH).

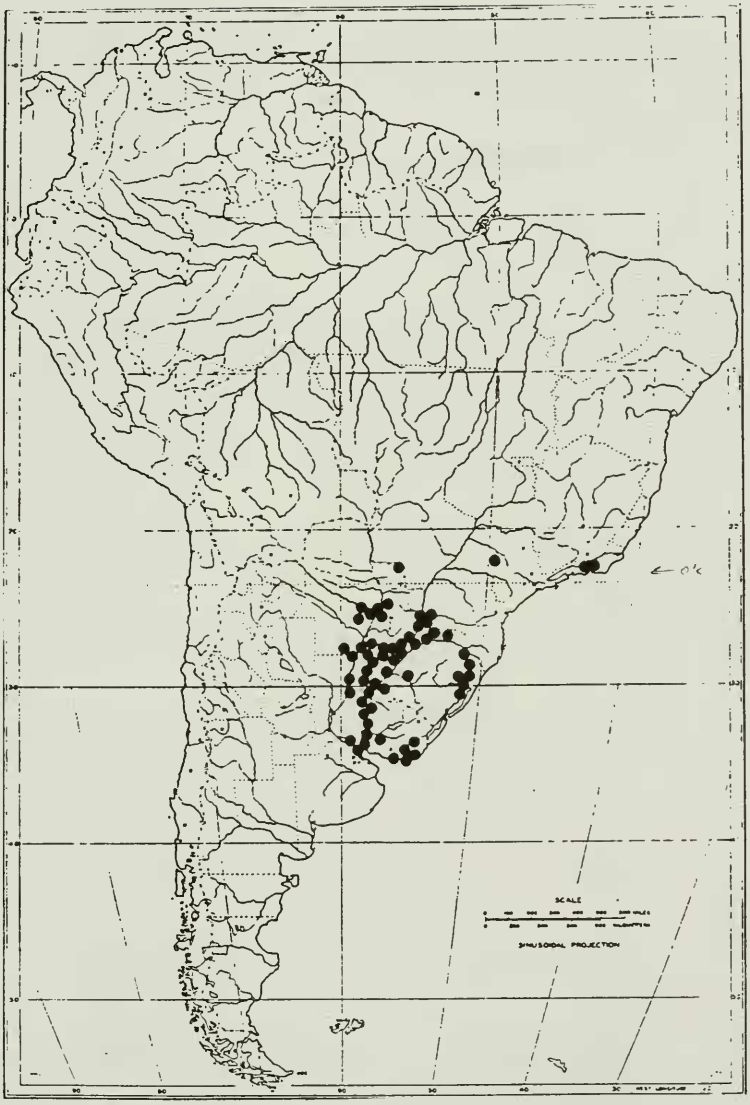

Figure 4. Distribution of *Stemodia hyptoides*.

BRASIL. Paraná: Parque Nacional do Iguacu, 18 Feb 1950, *Pereira 5355* (LIL,MO). Rio de Janeiro: Mage, Baixada Fluminense, 11 Dec 1947, *Durante 1031* (PHIL,RB). Rio Grande do Sul: Boco dos Faria, Osorio, 8 May 1950, *Rambo 47044* (C,CAS,LL). Santa Catarina: Itapiranga, 17 Oct 1964, *Smith 12673* (F,NY,SI).

PARAGUAY. San Pedro: Villa Primavera, 27 Jan 1957, *Woolston 791* (TEX).

URUGUAY. Artigas: Bella Union, 28 Jan 1948, *Castellanos 15768* (LIL).

Stemodia lanceolata Benth. *in* DC., *Prodr.* 10:384. 1846. *Stemodiacra lanceolata* (Benth. *in* DC.) Kuntze, *Rev. Gen. Pl.* 2:466. 1891. TYPE: ARGENTINA. Mendoza: "In andibus Mendoza", w/o date, *Gillies s.n.* (LECTOTYPE: K! [selected here]; Isolectotype: OXF!). The lectotype is mounted on the same sheet with a collection of *Tweedie* from La Plata, Argentina, also cited in the protologue.

Stemodia lanceolata Benth. *in* DC. forma *angustifolia* Chodat & Hassler, Bull. Herb. Boiss., ser. II, 4:287. 1904. *Stemodia lanceolata* Benth. *in* DC. var. *angustifolia* (Chodat & Hassler) Minod, Bull. Bot. Soc. Genève, ser. II, 10:210. 1918. TYPE: PARAGUAY. "ad ripam lacus Ypacaray", 1898-1894, *E. Hassler 3035* (LECTOTYPE: G! [selected here]; Isolectotypes: BM!,G-DEL!,GH!,UC!).

Stemodia lanceolata Benth. *in* DC. forma *latifolia* Chodat & Hassler, Bull. Herb. Boiss., ser. II, 4:287. 1904. *Stemodia lanceolata* Benth. *in* DC. var. *latifolia* (Chodat & Hassler) Minod, Bull. Bot. Soc. Genève, ser. II, 10:210. 1918. TYPE: PARAGUAY. "in stagnis pr. concepcion," Sep 1901-1902, *E. Hassler 7473* (LECTOTYPE: G-DEL! [selected here]; Isolectotypes: BM!,G!,GH!,K!,MICH!,MO!, PHIL!,UC!). In the protologue, Chodat & Hassler also cited an albino flowered specimen *7473a* (G!), the sheet marked as an unicate.

Stemodia lanceolata Benth. *in* DC. forma *laxiflora* Chodat & Hassler, Bull. Herb. Boiss., ser. II, 4:287. 1904. TYPE: PARAGUAY. "in palude pr. Tobaty", Sep 1900, *Hassler 6385* (LECTOTYPE: G! [selected here]; Isolectotypes: BM!,G-BOIS!,UC!). While only a single collection number was cited in the protologue, two sheets were located in the Genève herbaria. One of these gave the location as quoted here; the other bore a printed label "Cerros de Tobaty", presumably a location different from that of the lectotype.

Stemodia scoparioides Hassler *ex* Minod, Bull. Soc. Bot. Genève, ser. II, 10:208. 1918. TYPE: PARAGUAY. "in regione calcarea cursus

superioris fluminis Apa", 1912-1913, *E. Hassler 11019* (LECTOTYPE: G! [selected here]; Photolectotypes: F!,GH!,MO!; Isolectotypes: BAF!,BM!,G!,G-DEL!,K!). The herbarium at G has 5 sheets of type material; the sheet selected as lectotype is marked as in the G herbarium, although photographs of this specimen, cited above, are said to be in G-DEL.

Stiffly erect perennial rhizomatous herbs mostly 30-80 cm high. Stems 4-5 sided or terete, densely glandular-pubescent, the hairs mostly 0.2 mm long or less, among these often dispersed a smattering of longer eglandular hairs. Midstem leaves mostly 3-8 cm long, 0.5-1.8 cm wide, sessile and clasping, arranged 2-3(-4) at a node, lanceolate to oblanceolate, pinnately nervate, glandular-pubescent. Flowers axillary, mostly arranged in terminal bracteate interrupted spikes, 2-4 to a node, the bracts lanceolate, mostly as long as or 2 times as long as the subtended flowers, the pedicels 0-4 mm long. Sepals 5, ± alike, 4-6 mm long, linear-lanceolate, glandular-pubescent, subtended by 1 or 2 similar basal bracts. Corollas mostly 12-16 mm long, lilac, glandular-pubescent, the lobes 3-5 mm long. Anther thecae purple, separated by a small ovoid connective. Capsule ovoid, 4-5 mm long, 4-valvate, their apices shortly recurved apically. Seeds ellipsoid, ca. 0.5 mm long, stipitate, ornamented with scattered warts.

DISTRIBUTION (Figure 5): Southernmost Brazil, Paraguay, Uruguay, and Argentina in mostly heavy alluvial silty soils, 100-500 m; flowering November-March.

Robust very bushy forms with narrow leaves have been called *Stemodia scoparioides* by Minod. Except for the exceptional habit, such plants appear to belong to *S. lanceolata*, having the glandular foliage and large corollas of the latter.

Stemodia lanceolata is mostly readily distinguished from associated species (i.e., *S. hyptoides* and *S. stricta*) by its lanceolate leaves, larger flowers, and elongate primary bracts of the inflorescence. Nevertheless, it is quite variable, presumably due to the occasional hybridization with one or more of these species. It might also produce the occasional hybrid with *S. lobelioides* where these occur together. For example, at least a few specimens of *S. lanceolata* appear to approach *S. hyptoides*, especially in leaf shape (*e.g.*, Paraguay, "in regione lacus Ypacarey" *Hassler 12407* [BM,G]). In as much as these two taxa are partially sympatric, the occasional hybrid might be expected. *Stemodia lanceolata*, in addition to its leaf shape, is readily distinguished from *S. hyptoides* by corolla size (mostly 10-15 mm long and markedly flaring at the lobes, vs. 7-10 mm long and less flaring).

REPRESENTATIVE SPECIMENS: ARGENTINA. Buenos Aires: Conesa, camino canal 9, 26 Feb 1972, *Burkhart 28979* (UC). Chaco: Resistencia, Barranqueras, ca. 55 m, 23 Dec 1950, *Meyer 1625* (LIL). Cordoba: Cruz del Eje,

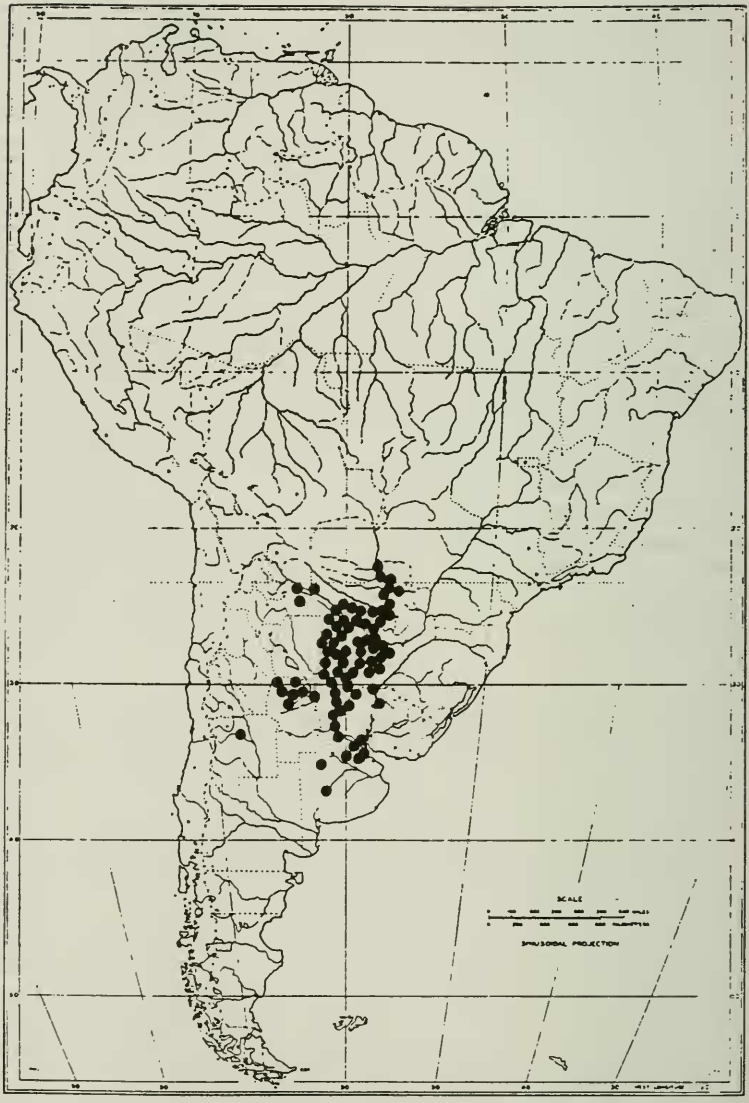

Figure 5. Distribution of *Stemodia lanceolata*.

ca. 470 m, 20 Dec 1947, *Meyer 12868* (LIL). Corrientes: Bella Vista, 18 km S Bella Vista, 28 Dec 1983, *Cowan 4189* (TEX). Entre Rios: Victoria, Isla del Pillo, 20 Dec 1937, *Burkhart 8745* (SI). Formosa: Pilcomayo, 7 Dec 1948, *Morel 6774* (LIL). Salta: Oran, Embarcación, 20 Dec 1946, *Malvarez 349* (LIL). Santa Fe: G. Obligado, Villa Aña, 3 Feb 1946, *Hayward 1446* (LIL).

PARAGUAY. Puerto Anteguera, Dec 1916, *Rojas 1866* (SI); Puerto Santa Rita, Mar 1917, *Rojas 2414* (LIL); San Pedro, Alto Paraguay, Primavera, 22 Feb 1959, *Woolston 1061* (UC).

URUGUAY. Paysandu, 1 Feb 1948, *Castellanos 15187* (LIL).

Stemodia latifolia Regel, *Ind. Sem. Hort. Petrop.* 39. 1861. TYPE: Apparently grown in the Botanical Gardens in Leningrad from unknown sources (HOLOTYPE: LE!).

Perennial (?) herb to 40 cm (?) high, drying blackish. Stems (uppermost) densely pilose, the hairs septate, uniseriate, eglandular, 1-2 mm long. Leaves (at or near mid-stem) mostly 3-7 cm long, 2-5 cm wide; petioles 2-8 mm long; blades broadly ovate to subcordate, subpinnately nervate, pilose above and below, the lower surfaces markedly glandular-punctate, the margins crenulodentate. Flowers sessile, arranged terminally in dense bracteate spikes, the latter 2-5 cm long, ca. 2 cm wide. Sepals 5, ± alike, narrowly ovate, 5-6 mm long, 1.5-2.0 mm wide, free to the base, pubescent like the stems, bounded beneath by 2 bracts, the latter lanceolate-elliptic, ca. 5.5 mm long, 1.2 mm wide. Corollas zygomorphic, pilose near the orifice within, the upper 3 lobes ca. 2 mm long, the lower lobes 4-5 mm long, the tube ca. 5 mm long, 2-3 mm wide, sparsely pubescent. Stamens 4, arising at ca. 2.5 mm from the base, the base of each pilose; anther thecae glabrous, unequal and separated by a well-defined swollen connective, the larger thecae ca. 0.8 mm long, the smaller thecae ca. 1/2 that size. Ovary ovoid, glabrous; styles short at anthesis, ca. 4.5 mm long, the expanded stigmatic region ca. 0.5 mm long, reflexed. Capsule broadly ovate, loculicidally 4-valvate, the apices erect. Seeds ellipsoid, pedicellate, ca. 0.6 mm long, 0.3 mm wide, markedly ornate with a raised reticulum resembling that of a peanut hull.

DISTRIBUTION: Known only from the type; we believe the plant concerned to have a South American origin, possibly Brazil, since it appears most closely related to taxa from that region.

In an attempt to find additional information about this interesting collection I wrote to LE so as to inquire if archival records might exist by which to identify the source of this species. Unfortunately, they reported by letter that no such information could be located.

Stemodia lobata J.A. Schmidt *in* Martius, *Fl. Brasil.* 8:299. 1864. TYPE: BRASIL. Minas Gerais: Mpio. Ovro Preto, "In monte Itaclumi", Feb 1835, *L. Riedel s.n.* (LECTOTYPE: HBG? [selected here]; Isolectotypes: LE!, 2 sheets). The types bear the annotations "*Stemodia lobata* Nov. sp."

Stemodia damaziana Beauv., Bull. Herb. Boiss., ser. II, 7:151. 1907. TYPE: BRASIL. Minas Gerais: Morro de San Sebastian, 27 Mar 1905, *L. Damazio 294* (HOLOTYPE: G-BOIS!; Photoholotypes: F!,GH!,MO!; Isotypes: G-BOIS!,G-DC! [2 sheets].

Erect suffruticose perennial herbs 20-40 cm high. Stems terete, minutely glandular-pubescent throughout, the hairs mostly 0.3 mm long or less. Mid-stem leaves thin, mostly 2-6 cm long, 1.5-3.0 cm wide; petioles 5-10 mm long; blades broadly ovate to ovate-elliptic, subpinnately nervate, sparsely to moderately pubescent like the stems, the surfaces minutely glandular-punctate, the margins ± lobate with 5-7 shallow lobes to a side. Flowers axillary, arranged 2-4 to a node, the pedicels mostly 1-2 cm long, glandular-pubescent. Sepals 5, ebracteate, all alike, 4-5 mm long, linear-ovate. Corollas blue, 14-18 mm long, glabrous or nearly so, the lobes 4-6 mm long. Anther thecae ca. 0.6 mm long, separated by an enlarged connective and shortly pedicellate. Capsules 5-7 mm high, 4-valvate, the apices arcuate; seeds ovoid, ca. 0.6 mm long, stipitate, 5-6 striate, ornamented like the hull of a peanut.

DISTRIBUTION (Figure 6): Known only from Minas Gerais, Serra do Itacolomy and vicinity; flowering October-January.

As noted by comments in the above synonymy, *Stemodia damaziana* appears to be the same as the earlier *S. lobata*, both collected at or near the same locality.

ADDITIONAL SPECIMENS EXAMINED: BRASIL. Minas Gerais: Mpio. Ouro Preto, Serra de Itacolomy, 28 Dec 1950, *Badini 2763* (MO); Oct 1937, *3162* (F); 1938, *3300* (F).

Stemodia lobelioides Lehmann, *Del. Sem. Hort. Hamb. Bot.* 1835; Linnaea 11:91. 1837. TYPE: Grown in the Berlin Botanical Garden in August, 1834, from a source not named, but possibly from Tweedie or yet others collecting in the vicinity of Buenos Aires during 1830-1834 (HOLOTYPE: B [destroyed?]; Photoholotypes: F!,GH!,MO!).

Gratiola tetragona Hook., Curtis Bot. Magazine 6: t. 3434. 1832. *nom. illegit. Stemodia tetragona* (Hook.) Minod, Bull. Soc. Bot. Genève 10:205. 1918. *nom. illegit.* Not *Gratiola tetragona* Ell., *Sketch* 1:15. 1824. TYPE: ARGENTINA. Buenos Aires: Buenos Aires, grown from seed sent to the Botanical Garden of Glasgow by Mr.

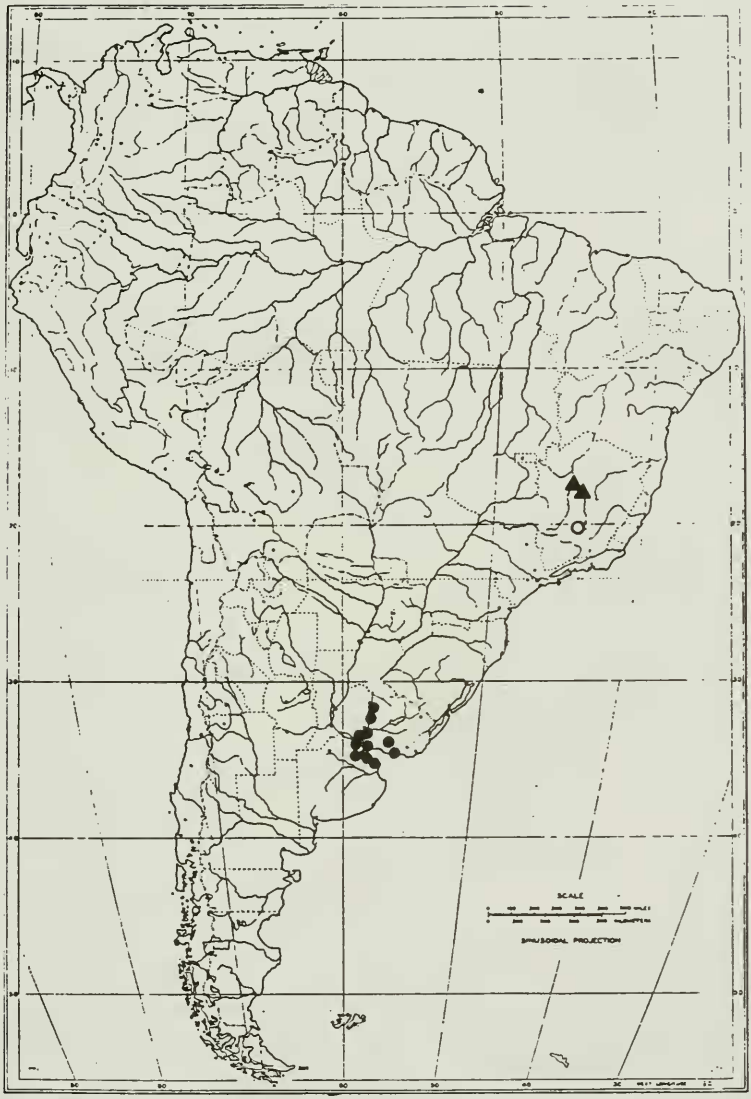

Figure 6. Distribution of *Stemodia lobata* (open circles); *S. lobelioides* (closed circle); *S. microphylla* (closed triangle).

Tweedie, "Cultivated in the stove, it produced bright blossoms in August, 1831." (HOLOTYPE: K!).

Gratiola hookeri Walp., *Walp. Rep.* 3:286. 1845. TYPE: ARGENTINA. "Bonaria", w/o date, w/o collector. Walpers gives a rather detailed description with the publication of this name but notes that the plant is the same as *Gratiola tetragona* Hook., "nec Ell." Perhaps he was intent on providing a new name for Hooker's plant, unaware that this had already been provided by Lehmann.

Erect glabrous perennial rhizomatous herbs mostly 20-100 cm high. Stems ± robust, mostly 4-sided, from a crown of fibrous roots. Midstem leaves mostly 4-9 cm long, 1-2 cm wide, sessile, glabrous, broadly lanceolate to oblanceolate, clasping and often auriculate at the base, pinnately nervate, the surfaces weakly punctate, if at all, the margins serrate. Flowers axillary, mostly arranged in bracteate terminal interrupted spikes, the pedicels 0.2 mm long. Sepals 5, ± alike, 4-6 mm long, linear-lanceolate, glabrous or nearly so, rarely glandular, bounded immediately beneath by 2 linear-lanceolate bracts as long as or somewhat longer than the sepals. Corollas mostly 6-8 mm long, blue to violet, sparsely pubescent, the lobes 2-3 mm long, the interior portions of the tube densely white-villous. Anther thecae ca. 0.6 mm long, separated by a globose connective. Capsule ovoid, 4-5 mm long, 4-valvate, the apices erect. Seeds ovoid, ca. 0.6 mm long, stipitate, ornamented with scattered warts.

DISTRIBUTION (Figure 6): Argentina and Uruguay, more or less confined to the mouth of the Río de la Plata occurring in mostly clayey alluvial soils, 0-100 m; flowering November-March.

Several workers have applied the illegitimate name *Stemodia tetragona* to this species; as indicated above, the first legitimate name for the taxon is *S. lobelioides*. An excellent illustration of this taxon was published with the original description and an additional plate may be found in Dawson's (1979) treatment for the Flora of Entre Rios, Argentina.

Occasional specimens of *Stemodia lobelioides* have rather broad oblanceolate, ± pubescent leaves, especially along the terminal portions of the stem (e.g., *Cowan 4202, 4203* [TEX]). These are perhaps from introgressant populations, either ancient or recent. Additional field work is needed to ascertain the extent of possible intergradations between *S. hyptoides*, *S. lanceolata*, *S. lobelioides*, and *S. stricta*. These several taxa are closely related and probably do hybridize upon occasion.

REPRESENTATIVE SPECIMENS: ARGENTINA. Buenos Aires: Delta del Paraná, 12 Apr 1956, *Burkhart 1999* (TEX,US).

URUGUAY. Río de la Plata, insula San Gabriel, 7 Jan 1902, *Berro 1845* (G); Montevideo, ca. de la Barra de Sta. Lucia, 6 Jan 1984, *Cowan 4202, 4203* (TEX). The latter specimens approach *S. hyptoides*, as noted in the above discussion.

Stemodia maritima L., *Syst. Nat.*, ed. 10, 2:1118. *Scordium maritimum* fruticosum procumbens, flore coeruleo ... Sloane. 1696. *Stemodiacra maritima* (L.) P. Br., *Hist. Jamaica* 261. 1756. TYPE: JAMAICA. *Scordium maritimum* fruticosum procumbens, flore coeruleo ... Sloane *Houston s.n.* (LECTOTYPE: BM! [selected here, mounted on same sheet with sprigs of *S. maritima* collected by *Shakespear s.n.* and *Wright s.n.*]).

Stemodia maritima L. var. *rigida* J.A. Schmidt *in* Martius, *Fl. Bras.* 8:299. 1862. TYPE: BRASIL: Pernambuco, seashore, Island of "Itamarica" [Itamaraca], Dec 1897, *Gardner 1088* (LECTOTYPE: HBG? [selected here]; Isolectotypes: BM!,GH!). Specific locality and date from specimen at BM.

Stemodia piurensis Pennell, Not. Nat. Acad. Nat. Sci. Philadelphia 179:2. 1946. TYPE: PERU. Piura: river gravels, Quebrada Mogollon, Amotape Hill, 28-30 Mar 1941, *Oscar Haught & H.K. Svenson 11542* (HOLOTYPE: BKL!).

Stemodia fruticulosa Tsvelev, Bot. Zh. (Leningrad) 72:1663. 1987. TYPE: CUBA. Prov. Pinar del Río: Las Martinas, 10 May 1938, *J. Acuna & J. Roig 10845* (HOLOTYPE: HAC; Isotype: HAC).

Suffruticose prostrate or sprawling glandular-viscid perennial herbs, shrublets or shrubs mostly 0.3-1.5 m high. Stems erect to recumbent, variously pubescent with both long crisp uniseriate hairs and much shorter glandular-trichomes. Midstem leaves ovate, lanceolate, or elliptical, sessile, mostly 1.5-3.0 cm long, 0.5-1.2 cm wide, clasping, subpinnately nervate, glandular-viscid, the margins denticulate to entire. Flowers axillary, arranged 1 or 2 to a node, sessile, mostly covered by the leaves. Sepals 5, ± alike, linear-lanceolate to linear-oblanceolate, more or less scarious along the margins, subtended by 1 or 2 basal bracts (rarely not). Corollas 2.5-5.0 mm long, more or less glabrous throughout, the lobes 1-3 mm long, sparsely pubescent. Anther thecae ca. 0.5 mm long, glabrous, both of these well separated by their slender stalks which are ca. 0.5 mm long. Style with an erect bilobed unexpanded stigmatic region. Capsules ovoid, 2-3 mm long, 4-valvate, the apices erect. Seeds ca. 0.4 mm long, ovoid, black, stipitate, ornamented with a cross-mesh of raised ridges.

DISTRIBUTION (Figure 7). México (Quintana Roo) and Belize where perhaps introduced, West Indies and South America (Brazil and Perú), perhaps recently introduced into Perú, mostly occurring in saline beach sands and along estuaries in alluvial soils, 0-100 m; flowering all seasons.

Minod (1918) treated this taxon as the only member of the genus *Stemodiacra* P. Br., which predates *Stemodia*. If combined, *Stemodia* has legitimacy, being conserved. Because of the large number of specimens available, only abbreviated citations are presented below.

Figure 7. Distribution of *Stemodia maritima*.

The recently described *Stemodia fruticulosa* appears to be a late-flowering form of the present species with somewhat smaller leaves (ca. 3-7 mm long vs. mostly 15-20 mm long).

REPRESENTATIVE SPECIMENS: BRASIL. Alagoas: *Fakao 1183* (F, RBI). Bahia: *Harley 16179* (MO,US). Ceara: *Urubi, Drouet 2159* (F). Paraiba: *Barbosa 226* (RBI). Pernambuco: *Gardner 1088* (GH). Minas Gerais: Piaui, *Sucre 10303* (RBI).

PERU: Tumbes: *Sagastegui 4040* (US).

Stemodia microphylla J.A. Schmidt *in* Martius, *Fl. Bras.* 8:298. 1864. TYPE: BRASIL. Minas Gerais: "In prov. Minarum: Langsdorff, in rupestrious Serra de Lapa ejusdem prov.: Riedel," 6 Nov 1824, *Riedel 1107* (LECTOTYPE: K! [selected here]; Isolectotypes: G-BOIS!,GH!,LE! [2 sheets]). As indicated in the above quote from the protologue, two collections were cited in Schmidt's original description. We have selected the Riedel collection as lectotype since it is well-represented by suitable dried material. All of the lectotypes cited above, except those from LE, were labeled "ex herbario horti Petropolitoni 1862/63" and bear the notation "*Stemodia microphylla* Schmidt, n. spec. (testa Schmidt)". The date of collection of the lectotype and the collection numbers were taken from specimens at LE.

Perennial decumbent stoloniferous or creeping herbs mostly 5-25 cm high. Stems terete, densely glandular-pubescent, the hairs mostly 0.6 mm long or less. Midstem leaves mostly 1.0-2.5 cm long, 5-20 mm wide; petioles 3-8 mm long; blades broadly ovate to subdeltoid in outline, pilose above and below, especially along the veins, subpinnately nervate, the lower surfaces ± punctate, the margins irregularly crenulodentate. Flowers axillary, arranged 1 or 2 to a node, the pedicels mostly 1-2 cm long, bracteolate. Sepals 5, one of these usually somewhat larger, ovate-elliptic, 5-6 mm long, 1.5-3.0 mm wide, at maturity somewhat scarious and markedly venose, ciliate-pilose, ± glandular-punctate. Corollas lilac, 11-13 mm long, glabrous, the lobes 3-4 mm long. Anther thecae ca. 0.4 mm long, separated by a fleshy globose connective somewhat larger than the anthers. Capsule broadly ovoid, 4-5 mm high, 4-valvate, their apices erect. Seeds ca. 0.7 mm long, ± squat-columnar, 6-8 sulcate, the ribs ± striate with small lateral depressions.

DISTRIBUTION (Figure 6). So far as known confined to the general region of Diamantina, Brazil, where it reportedly occurs on "rocky slopes and sand-filled pockets", 1200-1300 m; flowering November-April.

This species is readily identified by its unusually large sepals which, at maturity, become somewhat membranous with a pronounced reticulum of raised nerves. It is known to us by about twelve separate collections, all from the general vicinity of the type locality.

REPRESENTATIVE SPECIMENS: BRASIL. Minas Gerais: Serra de Espinhaco, ca. 26 km SW of Diamantina on road to Gouveia, 1300 m, "In sand-filled pockets beneath overhanging rocks.", 16 Jan 1969, *Irwin et al. 22064* (F,MICH,MO,NY,RB).

Stemodia palustris Saint-Hilaire, *Hist. Pl. Remarq. Bresil* 1:216. 1824. *Stemodiacra palustris* (Saint-Hilaire) Kuntze, *Rev. Gen. Pl.* 2:166. 1891. TYPE: BRASIL. Prov. Rio Grande do Sul: "Crescit in pascuis humidis vel paludosis prope praecipitem aquae lapsum fluminis *Uruguay* dictum *Salto Grande* rivulumque *Garapuita*", Jan 1816-1821, *A. Saint-Hilaire s.n.* (HOLOTYPE: P!; Isotype or possibly fragment of holotype: F!).

Stemodia gratiolifolia Saint-Hilaire, *Hist. Pl. Remarq. Bresil* 1:217. 1824. *Stemodiacra gratiolifolia* (Saint-Hilaire) Kuntze, *Rev. Gen. Pl.* 2:166. 1891. TYPE: BRASIL. Rio Grande do Sul: margin of Rio Toropasso, Jan 1816-1821, *A. Saint-Hilaire s.n.* (LECTOTYPE: P! [selected here]). In the protologue, Saint-Hilaire also cites specimens from "provincia Missionum."

Stemodia palustris Saint-Hilaire var. *simplex* J.A. Schmidt *in* Martius, *Fl. Bras.* 8:301. 1864. TYPE: BRASIL. "ad fluvios Rio Negro et Uruguay", 1816-1822, *A. Saint-Hilaire s.n.* (HOLOTYPE: P!; Isotypes: P!).

Stemodiacra linearifolia Morong, Ann. N.Y. Acad. Sci. 7:183. 1893. *Stemodia linearifolia* (Morong) Greenm. & Thompson, Ann. Missouri Bot. Gard. 1:409. 1914. TYPE: PARAGUAY. Pilcomayo River, 1888-1890, *T. Morong 1534* (HOLOTYPE: NY; Isotypes: MO!,WIS!,US!).

Stemodia linearifolia (Morong) Greenm. & Thompson var. *acutifolia* Chodat & Hassler, Bull. Herb. Boiss., ser. II, 4:286. 1904. TYPE: PARAGUAY. "in stagno pr. Piribebuy, Dec 1900, *E. Hassler 6665* (LECTOTYPE: G! [selected here]; Isolectotypes: BM!,UC!). In the protologue, *Hassler 42* (G!,K!) was also cited.

Stemodia palustris Saint-Hilaire forma *salicifolia* Minod, Bull. Soc. Bot. Genève, ser. II, 10:208. 1918. TYPE: PARAGUAY. "in regione cursus inferioris fluminus Pilcomayo", Jul 1906, *Rojas 378* (HOLOTYPE: G!).

Perennial rhizomatous or stoloniferous, glaucous, sparsely glandular-pubescent to nearly glabrous herbs mostly 20-50 cm high, often drying black. Stems mostly 4-sided, sparsely atomiferous or short-glandular at first but soon glabrescent, the basal portion often producing well-defined leafy stolons. Midstem

leaves mostly 2 to a node, sessile, weakly clasping at the base, mostly 2.5-6.5 cm long, 0.3-1.5 mm wide, linear-lanceolate to somewhat oblanceolate, glabrescent, weakly to strongly glandular-punctate, weakly subpinnately nervate, the margins entire or nearly so. Flowers arranged in terminal interrupted bracteate spikes, 2-4 to a node, the bracts mostly as long as or shorter than the subtended flowers, the pedicels 0-3 mm long, glandular-pubescent. Sepals 5, ± similar, 3-5 mm long, linear-lanceolate, sparsely glandular-pubescent to glabrous, bounded beneath by 1 or 2 basal bracts similar to the sepals. Corollas mostly 6-8 mm long, the lobes 2-3 mm long, pubescent externally, sparsely white-pubescent within near the orifice. Anther thecae purple, glabrous, ca. 0.5 mm long, separated by a globose connective. Capsule ovoid, 3-5 mm high, 4-valvate, the valves erect. Seeds ellipsoid, ca. 0.5 mm long, ornate with scattered warts.

DISTRIBUTION (Figure 8): Southernmost Brazil, Paraguay, Uruguay, and Argentina in heavy silty or clay soils, mostly along rivers and about playas; flowering November-May.

In spite of its variability this is a readily recognized species, largely because of its glabrousity. The only other essentially glabrous taxon in southern South America, *Stemodia lobelioides* is easily distinguished by its more robust habit and larger corollas.

REPRESENTATIVE SPECIMENS: ARGENTINA. Chaco: Colonia Benitez, 55 m, 18 Jan 1941, *Meyer 3633* (GH,US). Corrientes: Mercedes, Ayo. Pay-ubre Grande, 2 Nov 1971, *Krapovickas 20383* (LIL). Entre Rios: Concordia, Nueva Esconcia, 30 Apr 1979, *Troncoso 2589* (SI). Formosa: Pirane, 5 km E of Pirane, 28 Nov 1945, *Morel 467* (LIL). Misiones: Candelaria, 25 Nov 1945, *Berloni* (?) *2462* (LIL). Santa Fe: General Obligado, 1 Feb 1946, *Hayward 1428* (LIL,PHIL).

BRASIL. Rio Grande do Sul: Quarai, 18 Mar 1948, *Palacios-Cuezzo 1998* (LIL).

PARAGUAY. Concepción: Belen, 10 km S of Concepción, 16 May 1971, *Schinini 9180* (COR). President Hayes: 86 km from Asunción along trans Chaco highway, 16 Jan 1983, *Simonis 15* (F). San Pedro: Primavera, 10 Feb 1957, *Woolston 798* (US).

URUGUAY: Artegas: Sta. Rosa Cuareim, 27 Nov 1927, *Herter 1064* (F,US). Florida: Rincón de Santa Elena, Nov 1946, *Gallinal 5811* (US). Salto: near Salto Grande, 22 Mar 1910, *Olsten 5388* (US).

Stemodia pratensis (Aublet) C. Cowan, *comb. nov.* BASIONYM: *Matourea pratensis* Aublet, *Pl. Guian.* 641, t. 259, 1775. TYPE: FRENCH GUIANA. Meadows of Cayenne Island, w/o date, *Aublet s.n.* (HOLOTYPE: P?). Lacking a specimen, the illustration (in spite of the 4-sepaled calyx) accompanying the original description might serve as an

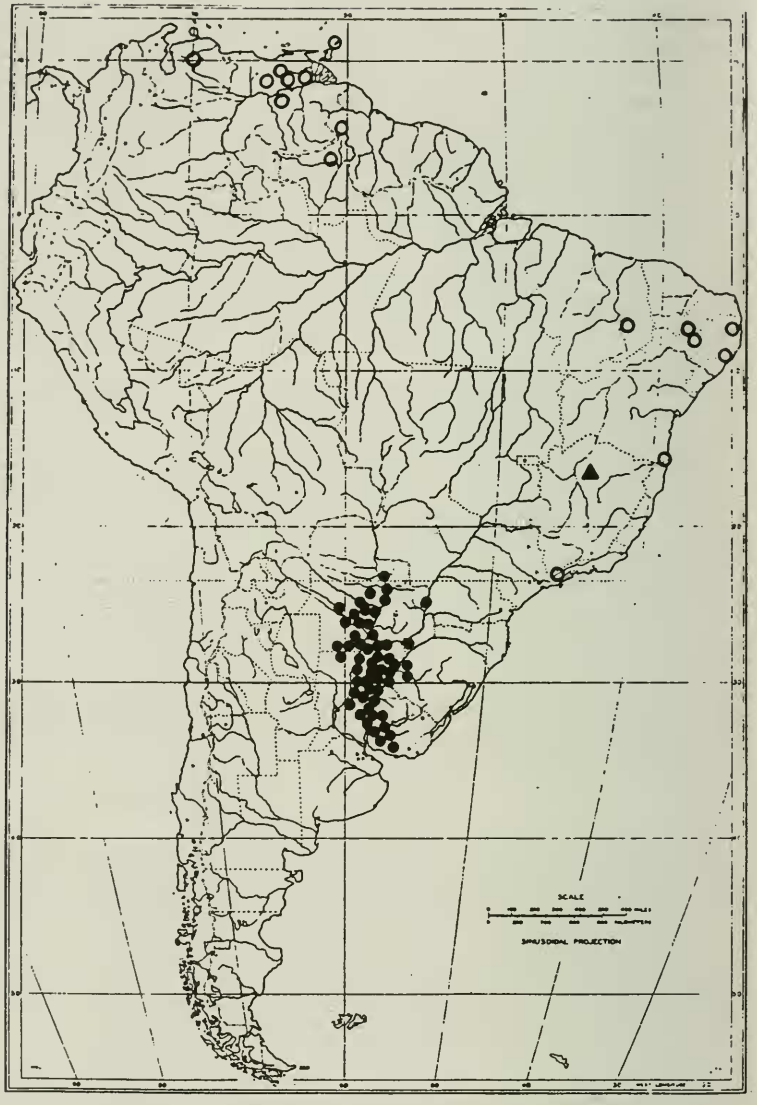

Figure 8. Distribution of *Stemodia palustris* (closed circles); *S. pratensis* (open circles); *S. stellata* (closed triangle).

adequate type since in all other characters it matches material herein cited.

Stemodia foliosa Benth., Hook. J. Bot. 2:46. 1840. *Stemodiacra foliosa* (Benth.) Kuntze, *Rev. Gen. Pl.* 2:466. 1891. TYPE: BRITISH GUIANA: Roraima, 1842-1843, *Schomburgk 513/787* (LECTOTYPE: K! [selected here]; Photolectotype: NY!; Isolectotype: BM!). Numerous specimens by several collectors were cited in the protologue; the lectotype, a fine specimen, was already designated as a type by someone at K. The locale, "Roraima" occurs on the Isolectotype: (BM). Bentham unnecessarily provided a new name, *Stemodia foliosa*, for Aublet's (1755) earlier *Matourea pratensis*, and he listed the latter name in his protologue, presumably believing this to be inadequately illustrated or vouchered for.

Stiffly erect suffruticose herbs or shrublets mostly 0.5-1.8 m high. Stems terete, variously pubescent with both glandular and nonglandular hairs, the latter mostly uniseriate, crinkly 1-2 mm long, the former much shorter and more numerous. Midstem leaves mostly 4-7 cm long, 1.3-2.0 cm wide; petioles 0.5-1.5 cm long, grading into the blades, pubescent like the stems; blades lanceolate to ovate-lanceolate, pubescent like the stems, pinnately nervate, the margins serrulate. Flowers axillary, mostly arranged 2 to a node, the peduncles ebracteate, mostly 2-5 mm long. Sepals 5, ± all alike, 3-5 mm long, lanceolate, pilose. Corollas 5-7 mm long, blue to lilac, sparsely pubescent without, markedly pilose within, especially near the base of the tube, the lobes 1-2 mm long. Anther thecae ca. 0.4 mm long, glabrous, separated by an ellipsoid connective, stigmatic area enlarged, recurved at maturity. Capsule narrowly ovoid, 2.5-3.5 mm high. Seeds ovoid, ca. 0.5 mm long, 6-8 sulcate, stipitate, the ribs ornated with numerous lateral depressions (resembling that of a peanut hull).

DISTRIBUTION (Figure 8): West Indies (Trinidad, where perhaps introduced), and northern South America (Brazil and Venezuela).

Stemodia pratensis is readily distinguished from most other species of northeastern South America by its suffruticose habit. Robust forms superficially resemble *S. suffruticosa* H.B.K. of northwestern South America.

This taxon was not included in the treatment of *Stemodia* for North America and the Caribbean Islands (Turner & Cowan 1993) since the single collection from Trinidad (cited below) is thought to be a chance introduction.

REPRESENTATIVE SPECIMENS: WEST INDIES: TRINIDAD. Marcos Bay, growing near the sea in sandy soil, 8 Mar 1926, *Broadway 6073* (AA,BM,G,K,MO,UC).

SOUTH AMERICA: BRASIL. Bahia: Belmonte, outskirts of town, sea level, 26 Mar 1974, *Harley 17440* (K,LIL,MO,US). Ceara: Crato, 1948, *Duarte 1325* (G,GH,MO,RB). Guanabara: Restinga de Gavea, 7 Jul 1944, *Machado*

s.n. (LIL,MO,RB). Paraiba: Estación doc Parahyba, w/o date, *S. Goncalo Souza 53* (PHIL,RB). Pernambuco: Pernambuco, Escola Olinda, 8 May 1925, *Pickel 927* (PHIL,US).

VENEZUELA. Anzoategui: SE of Santome, 17 Dec 1940, *Pittier 14562* (US). Bolívar: between Hate de Nuria and Quebrada Caballape, 380 m, 21 Jan 1961, *Steyermark 88685* (UC,US). Lara: near Santa Rosa, 400 m, 16 Jan 1939, *Alston 6334* (US). Monagas: along highway 6, between Temblador and El Silencio, 100 m, 27 Oct 1977, *Steyermark 115386* (MO).

Stemodia stellata B.L. Turner, *sp. nov.* TYPE: BRASIL. Minas Gerais: Serra do Espinhaco, eastern slopes of Pico do Itambe, first large sandstone outcrop below the summit, ca. 1700 m, 11 Feb 1972, *W.H. Anderson, M. Stieber, & J.H. Kirkbride, Jr. 35828* (HOLOTYPE: MO!; Isotype: NY).

Stemodiae damazianae Beauv. similis sed foliis minoribus (1-2 cm longis vs. 2-6 cm) pubescentibusque trichomatibus stellaribus (vs. pilosis vel glandulosisque trichomatibus simplicibus) differt.

Erect perennial herbs 20-30 cm high. Stems terete below, 4-sided upwards, densely pubescent throughout with stellate hairs. Midstem leaves mostly 2 or rarely 3 to a node, 1-2 cm long, 0.5-1.2 cm wide; petioles 2-4 mm long; blades thin, broadly ovate to ovate-elliptic, subpinnately nerved, pubescent on both surfaces with stellate hairs, the surfaces with small to very large atomiferous-glandular secretions, the margins crenulate. Flowers axillary, arranged 2 to a node, the peduncles ebracteate, mostly 8-12 mm long, stellate. Sepals 5, ± alike, thin, lanceolate, both pubescent and atomiferous-glandular. Corollas more or less broadly funnelform, only slightly zygomorphic, 12-15 mm long, reportedly "white and lilac, the throat dark purple", the tube 7-8 mm long, glabrous or nearly so, the lobes broad and held erect, taken together about 10 mm wide at the apex. Anther thecae glabrous, ca. 0.5 mm long, well separated by a globose connective. Style, at anthesis, about 5 mm long, the stigmatic portion enlarged like a cobras head and recurved. Capsule ovoid, ca. 5 mm high, 4-valvate, the apices erect. Seeds ellipsoid, ca. 0.8 mm long, stipitate, 16-18 striate, the furrows parallel.

The species is only known by type material (Figure 6). It is an exceedingly distinctive taxon, what with its stellate pubescence (not known in any other species of *Stemodia*) and large flaring corollas. Nevertheless it has all of the generic characters of *Stemodia* and appears to relate to members belonging to the ebracteate series, especially *S. damaziana*.

Stemodia stricta Cham. & Schlecht., Linnaea 3:10. 1828. *Stemodiacra stricta* (Cham. & Schlecht.) Kuntze, *Rev. Gen. Pl.* III, 2:239. 1898. *Stemodia hyptoides* Cham. & Schlecht. var. *stricta* (Cham. & Schlecht.) Dawson, *Fl. Entre Rios* 5:470. 1979. TYPE: BRASIL. ("semel e Brasilia tropica Sellowius misit specimina florere incipientia.") w/o precise locality, w/o date, *Sellow 1514* (LECTOTYPE: B [destroyed]; Photolectotypes: F!,GH!,MO!; Isolectotype: K!). The varietal combination "*S. hyptoides* var. *stricta* Hassler [in manuscript]" was listed by Minod as a synonym of the present taxon but the name is a *nom. nudum.*

Stemodia stricta Cham. & Schlecht. ssp. *glabriuscula* Kuntze, *Rev. Gen. Pl.* III, 2:239. 1898. TYPE: PARAGUAY. Southern Paraguay, Sep 1892, *O. Kuntze s.n.* (HOLOTYPE: NY; Isotype: US!).

Stemodia stricta Cham. & Schlecht. forma *minor* Chodat & Hassler, Bull. Herb. Boiss, ser. II, 4:287. 1904. *Stemodia stricta* Cham. & Schlecht. var. *multidentata* Minod, Bull. Bot. Soc. Genève 10:225. 1918. TYPE: PARAGUAY. "in campis of San Bernardine, 1885-1895, *Hassler 1180* (LECTOTYPE: G! [selected here]; Photoholotypes: F!,GH!,MO!; Isotypes: G!,K!). Minod included *S. stricta* forma *minor* in his concept of this taxon, citing the type of the latter in his protologue. I have selected here *Hassler 1180*, as an appropriate lectotype for var. *multidentata.*

Stemodia stricta Cham. & Schlecht. var. *paucidentata* Minod, Bull. Soc. Bot. Genève 10:222. 1918. TYPE: PARAGUAY. "In regione calcarea cursus superioris fluminis Apa.", 1912-1913, *E. Hassler 11018a* (LECTOTYPE: G! [selected here]; Isolectotypes: BAF!, G!). Minod also cited *Hassler 11606* in his protologue.

Erect "annual" (perhaps merely first-year flowering forms) or rhizomatous perennial herbs mostly 10-40 cm high. Stems 4 or 5 sided, variously densely to moderately pubescent with glandular or eglandular hairs, either throughout or variously intermixed. Midstem leaves mostly 2 to a node, sessile or pseudopetiolate, clasping and somewhat flanged at the base, mostly 2-5 cm long, 0.5-3.0 cm wide, ovate, ovate-elliptic to oblanceolate, variously pubescent, subpinnately-nervate, the surface glandular-punctate, the margins irregularly serrate. Flowers axillary, arranged in terminal bracteate interrupted spikes, the bracts mostly shorter than the subtended flowers, the pedicels 0-3 mm long. Sepals 5, ± similar, linear-lanceolate, 3-5 mm long, pubescent like the stems, subtended beneath by 1 or 2 similar but somewhat longer (rarely shorter) basal bracts. Corollas purple, mostly 7-10 mm long, the lobes 2-3 mm long, sparsely pubescent without, the throat with long white hairs within near the orifice. Anther thecae purple, ca. 0.5 mm long, glabrous, separated by a globose connective. Capsule ovoid, 3-5 mm high, 4-valvate, the valves erect at

maturity. Seeds ellipsoid, ca. 0.5 mm long, pedicellate, ornate with scattered warts.

DISTRIBUTION (Figure 7): Southernmost Brazil, Bolivia, Paraguay, Uruguay, and Argentina, 100-1000 m, wet places; flowering November-April.

Stemodia stricta, as conceived here, has an unusual distribution as shown in Figure 7. There appear to be two regions of concentration: 1) along the eastern front range of the Andean sierras; between latitudes 20 and 30 degrees south; and 2) along the Uruguay River drainage basin of eastern South America, also between latitudes 20 and 30 degrees. Type material was obtained from the latter region (southern Brazil) and is characterized by having rather evenly leafy stems and relatively small corollas, but otherwise it differs but little from plants collected across the range of the species.

Dawson (1979) treated *Stemodia stricta* as a variety of *S. hyptoides*, noting that they shared nearly identical foliage and corollas. She further noted, however, that *S. stricta* appeared to prefer acid soils and is "primaveral" or annual, being a smaller plant with fewer leaves, with a tendency to form quickly flowering stems from a rosette. *Stemodia hyptoides*, in contrast, is a robust plant with rather evenly spaced, overlapping, much larger leaves and takes a longer period to flower.

Stemodia hyptoides is partially sympatric with the more eastern populations of *S. stricta*. In spite of this, relatively few intermediates between these have been found among the several hundred sheets of these two taxa examined in the present study. Were these to be weakly differentiated intergrading allopatric taxa, we would have favored varietal status for *S. stricta*. But as nearly all of the specimens are readily characterized as one or the other taxon, even in regions of sympatry, they have been retained as species. Occasional plants which appear to be intermediates are perhaps either hybrids between *S. stricta* and *S. lanceolata* (e.g., *Morong 78* from Paraguay [NY,US]), which was cited by Minod (1918) as "*S. durantifolia*", or else between *S. stricta* and *S. hyptoides* (e.g., *Montes 15736* from Paraguay [LIL]), the latter annotated by Descole & Borsini as *S. durantifolia*, which it superficially resembles. Since *S. stricta*, *S. hyptoides*, and *S. lanceolata* (not to mention the glabrous taxa *S. palustris* and *S. lobelioides*) are at least partially sympatric over some, if not most, of their ranges in Argentina, it would not be surprising if the occasional hybrid between these several potential combinations might be found. Indeed, Minod (1918) called attention to a "Typus intermedius" within the *S. stricta* complex (*Hassler 531*, San Ignacio Paraguay) which he took to be a putative hybrid between *S. stricta* and *S. hyptoides*.

These several taxa are in much need of field study. Surprisingly few collectors have found them growing together; if so, they have not commented upon their close spatial proximity, nor noted hybrids between them.

REPRESENTATIVE SPECIMENS: ARGENTINA. Catamarca: Ambato, Las Juntas, 15 Mar 1959, *Villa 1162* (LIL). Cordoba: Cruz del Eje, ca. 470

m, 20 Dec 1947, *Meyer 13272* (CAS). Corrientes: San Roque, 3.6 km E ca. 9 de Julio, 28 Dec 1983, *Cowan 4191* (TEX). Jujuy: San Pedro, Río San Francisco, 600 m, 14 Oct 1929, *Venturi 9630* (GH,MO,US). Misiones: San Pedro, Eldorado, 8 Dec 1948, *Schwarz 68749* (TEX). Salta: Santa Victoria Parque, Lipeo, Río Naranjo, 20 Oct 1980, *Zuloaga 1149* (TEX). Tucumán: Monteros, Río Los Sosas, 16 Nov 1983, *Cowan 4009* (TEX).

BOLIVIA. Santa Cruz, Banados del Río Grande (Cabezas) Cordillera, 390 m, 28 Mar 1945, *Peredo 501* (LIL); Tarija, Villa Montes, 28 May 1971, *Krapovickas 19407* (CTES).

BRASIL. Paraná: Guarapuava, Fagenda Campo Real, 1000 m, 16 Dec 1965, *Reitz 17797* (GH,MO,UC). Rio Grande do Sul: 25 km N of Santo Angelo, 2 Nov 1971, *Lindeman 9019* (CTES). São Paulo: Itu, 25 Nov 1897, *Russel 15144* (PHIL).

PARAGUAY. Amambay, Bella Vista, 15 Dec 1983, *Cowan 4168* (TEX); Central Paraguay, 1888-1890, *Morong 833* (G,MKH,MO,US); San Pedro, Alto Paraguay, Prima Vera, 8 Dec 1954, *Woolston 389* (TEX,UC).

Stemodia suffruticosa H.B.K., *Nov. Gen. & Sp.* 2:287. 1817. *Stemodiacra suffruticosa* (H.B.K.) Kuntze, *Rev. Gen. Pl.* 2:466. 1891. TYPE: PERU/ECUADOR. "inter pagum Oña et flumen Saraguru in Regno Novo-Granatensi, alt. 1200 hex, Jul, *Humboldt & Bonpland 3315* (HOLOTYPE: F; Photoholotypes: GH!,MO!,P!; Fragment of holotype: F!).

Unanvea febrifuga Ruíz & Pavon *ex* Benth. *in* DC., *Prodr.* 10:380. 1846. TYPE: PERU. "Ex Loxa montibus," w/o date, *Ruíz & Pavon s.n.* (LECTOTYPE: BM! [selected here]). Bentham merely listed "*Unanvea febrifuga* Ruiz et Pav. ic. ined." in synonymy. *Index Kewensis* (II:1145. 1895.) cites Bentham as the name maker, although lithograph plates for the Ruíz & Pavon Iconograph exist (*e.g.*, G-DEL; Photograph: F!). Because of the confusion apparent here I have selected the BM specimen as lectotype since it is apparently the basis for Bentham's citation.

Stemodia suffruticosa H.B.K. var. *villosa* Benth. *ex* Minod, Bull. Soc. Bot. Genève 10:201. 1918. TYPE: ECUADOR. w/o locality, 1857-1859, *Spruce 5967* (LECTOTYPE: G-BOIS! [selected here]; Photolectotypes: F!,GH!,MO!; Isolectotypes: G!,G-DC!,K!,LE!; Photoisolectotypes: F!,MO!). Spruce might have also collected this in Perú, Prov. San Martín, for he collected in that region during July-December of 1857.

Stemodia suffruticosa H.B.K. forma *dentata* Minod, Bull. Soc. Bot. Genève 10:201. 1918. *Unanvea dentata* (Minod) Pennell, Proc.

Acad. Phil. 72:161. 1920. TYPE: ECUADOR. w/o locality, 1857-1859, *Spruce 5066* (LECTOTYPE: G! [designated here]; Isolectotypes: C!,F!,G-BOIS!,G-DC!,GH!,K!,OXF!). Two sheets of what appear to be type material were located at G and G-BOIS, presumably both examined by Minod, but without indication of forma *dentata*. See comments above regarding the Spruce collections.

Stemodia chodatii Minod, Bull. Soc. Bot. Genève 10:199. 1918. TYPE: PERU. Amazonas: Chachapoyas, 1836, *Matthews s.n.* (HOLOTYPE: G-BOIS!; Photoholotypes: F!,GH!,MO!; Probable isotype: BM!). Collections of this taxon from Chachapoyas (*Matthews 1533*) in 1835 (K!) do not match well the holotype or isotype and are probably not type material.

Suffruticose perennial herbs or shrublets mostly 0.5-1.5 m high. Stems moderately to densely hirsute with crinkly multiseptate hairs 0.5-1.5 mm long, these often intermixed with glandular hairs, either short or long. Midstem leaves 2-4 at a node, mostly 3-9 cm long, 1.2-3.0 cm wide; petioles 1-6 mm long, grading into the blades; blades broadly lanceolate to ovate-lanceolate, pinnately nervate, variously glandular-pubescent to hirsute, especially along the veins, the surfaces minutely glandular-punctate, the margins serrate. Flowers axillary, arranged 1-4 at a node, the pedicels mostly 5-20 mm long, pilose or glandular-pubescent or mixtures thereof. Sepals 5, ± all alike, mostly 5-7 mm long, linear-lanceolate, variously pubescent, basal bracts lacking. Corollas mostly 9-12 mm long, purple, the tube pubescent without, glabrous within, the lobes 2-4 mm long. Anther thecae ca. 1 mm long, separated by an ovoid connective. Capsule ovoid, 4-5 mm high, 4-valvate, the apices erect. Seeds ca. 0.5 mm long, 6-8 striate or sulcate, stipitate, ornamented like a peanut hull.

DISTRIBUTION (Figure 9): Colombia, Ecuador, and Perú, mostly east slopes of Andes, 1000-2600 m; flowering March-August.

Stemodia suffruticosa is variously described as a blue-flowered suffruticose herb or clambering shrub to 5 m high. It is clearly a very variable species, especially in leaf shape and vestiture. Densely pilose forms with ovate-lanceolate leaves have been described as var. *villosa*. Plants with somewhat thicker, more glabrate, conspicuously dentate leaves have been referred to forma *dentata*. Holmgren (1984) has provided an account of this species for Ecuador with numerous citations.

REPRESENTATIVE SPECIMENS: COLOMBIA. Cauca: above San Rafael, 2660-3450 m, 21 Jul 1948, *Hawkes 12866* (US). Huila: La Plata, ca. 2600 m, 6 Mar 1938, *Sneidern 2613* (F,US). Narino: road between Mayasquer to Tambo, 2900 m, 2 Aug 1935, *Mexia 7573* (F). Dutamayo: Sibundoy, 2225 m, 21 Aug 1968, *Bristol 1396* (GH).

ECUADOR. Azuay: Sevilla de Oro, Pallatanga, ca. 2500 m, 18-20 Apr 1968, *Harling 8519* (F). Cañar: San Miguel, 2500 m, 30 Jul 1963, *Tatıva 249*.

Figure 9. Distribution of *Stemodia stricta* (closed circles); *S. suffruticosa* (open circles).

Carchia: 12 km E of Maldonado, 2230 m, 27 Sep 1979, *Gentry 26648* (MO). Chimborazo: between Guayllanac and Hacienda "La Carmela", 1100-1350 m, 14 Aug 1943, *Solis 5305* (F). El Oro: between Paccha and Puente Grande, 1800-2430 m, 26 Aug 1943, *Steyermark 54134* (F). Loja: Canton Catacocha, Loma Larga, 2200-2400 m, 15 Apr 1944, *Solis 7837* (F). Pastaza: Pastaza, 1200 m, 10 May 1935, *Rimbach 276.*

PERU. Amazonas: above Colcamar, 2500-2800 m, 24-26 Jun 1948, *Pennell 15612* (PHIL). Cajamarca: San Andreas, 2050 m, 25 May 1965, *Lopez 5431* (MO). Piura: Palambla, 1150 m, 13 Aug 1981, *Lopez 8783* (MO).

Stemodia trifoliata (Link) Reichenbach, *Icon. Bot. Exotica* 1:3, *t.* 1. 1827. BASIONYM: *Columnea trifoliata* Link, *Pl. Enum. Berol.* 2:143. 1822. *Stemodiacra trifoliata* (Link) Kuntze, *Rev. Gen. Pl.* 2:466. 1891. *Valeria trifoliata* (Link) Minod, Bull. Soc. Bot. Genève, ser. 2, 10:251. 1918. TYPE: BRASIL. "Floruit in Caldario", w/o date or collector (HOLOTYPE: B [destroyed]; Possible isotype: MO!). Lacking an extant type, the illustration in *Icon. Bot. Exotica* (t. 1) might serve as an adequate substitute.

Columnea violacea Jacquin *in* Stendel, *Nomencl. Bot.*, ed. 2, 2:399. 1841.

Stemodia cruciflora Casaretto, *Nov. Stirp. Bras.* Dec. 9:78. 1844. TYPE: BRASIL. ["Legi ad bargines viarum campestrium circa Praia grande et in monte Corcovado prope Rio de Janeiro."] Praia grande, Rio de Janeiro, w/o date, *Casaretto 1746* (LECTOTYPE: TO [designated here]; Isolectotype: G-DC!; Photolectotypes: F!, MO!). The isolectotype label is written in the hand of Casaretto and was apparently transferred from Turin, Italy to G-DC in 1857, according to label data. Material from monte Corcovado collected by Casaretto, as alluded to in the protologue, was not located.

Suffruticose perennial herbs 50-100 cm high. Stems moderately to densely pilose, the hairs mostly eglandular, ca. 1 mm long. Midstem leaves thin, ovate, mostly 3-5 cm long, 1.5-2.5 cm wide, petioles 4-8 mm long, tapering upon the blades; blades subpinnately veined, sparsely pilose, epunctate, the margins crenulodentate. Flowers axillary, arranged (1-)2-4 at a node, the pedicels, ebracteate mostly 1-2 cm long. Sepals (4-)5(-6), ± alike, linear-lanceolate, 6-7 mm long, pilosulous, w/o basal bracteoles. Corollas violet, markedly zygomorphic, the tube 8-10 mm long, sparsely pubescent, the lobes 3-4 mm long. Anther thecae ca. 0.4 mm long, glabrous, separated by a small globose connective. Style erect throughout, the stigmatic area marked bilobed, each lobe ca. 0.5 mm long, 0.25 mm wide. Capsule ovoid, ca. 4 mm high, 4-valvate. Seeds 6-8 sulcate, the surfaces granulate.

DISTRIBUTION (Figure 10): Southern Brazil, mostly alluvial soils along waterways, 50-600 m; flowering November-March.

Minod (1918) positioned this species as the only member of his newly erected *Valeria*, said to be distinguished from *Stemodia* by its more labiate corollas, pronounced connectives, and seeds, none of which seems especially different from *Stemodia* (sensu Minod); although the erect bilobed stigmatic area does appear anomalous; taken alone, however, it hardly mitigates the syndrome of characters that would position it in *Stemodia*.

REPRESENTATIVE SPECIMENS: BRASIL Guanabara: Federal District, Pedra Dois Irmaos, Rio de Janeiro, 100-533 m, 23 Mar 1939, *Smith 2132* (F,GH). Minas Gerais: Marianna, Estrada de Itacolomy, 30 Dec 1933, *Barreto 6623* (F). Paraná: Cerro Azul, Morro Grande, 1 Apr 1952, *Smith 952* (SI,UPCB). Sào Paulo: Iporango, Rio Ribeira, 80 m, 7 Nov 1958, *Hatschbach 5207* (RB).

Stemodia veronicoides J.A. Schmidt *in* Martius, *Fl. Bras.* 8:298. 1864. TYPE: BRASIL. Bahia: "prope Ouro Preto in distr. dos Ilheos", Aug 1822, *L. Reidel s.n.* (LECTOTYPE [suggested here]: HBG?). Schmidt cited two specimens in his protologue, neither of which we located. However, three specimens annotated by Schmidt as "*Stemodia veronicoides* n. sp.!" are on deposit at LB!, two collected by Langsdorf and one by Riedel; all of these belong to *S. microphylla* J.A. Schmidt *in* Martius and are presumably misannotated.

Suffruticose erect or sprawling herbs mostly 30-50 cm high. Stems mostly 4-sided, the angles often forming narrow wings, sparsely to moderately pubescent with mostly crisp eglandular hairs. Midstem leaves mostly 3.0-5.0 cm long, 1.5-3.0 cm wide; petioles mostly 0.5-1.5 cm long; blades broadly ovate to subcordate, pubescent like the stems, subpinnately nervate, lower surfaces minutely punctate-glandular, the margins irregularly crenulate. Flowers axillary, arranged 1 or 2 to a node, the pedicels mostly 1.5-2.5 cm long with 2 pronounced bracts near the apex. Sepals 5, 1 of these somewhat enlarged, mostly 6-10 mm long, 2.5-4.5 mm wide, with age somewhat scarious and reticulate-venose, the margins pilose, the faces punctate-glandular. Corollas 14-16 mm long, glabrous, the lobes 3-4 mm long. Anther thecae ca. 0.7 mm long, well-separated by enlarged connectives. Capsules ovoid, 4-5 mm high, 4-valvate, their apices erect. Seeds columnar, ca. 0.6 mm long, 6-8 sulcate, stipitate, the ribs with lateral striations.

DISTRIBUTION (Figure 10): Montane coastal regions of eastern Brazil from Rio de Janeiro to near Salvador, 1000-1200 m; flowering November-May.

Stemodia veronicoides is closely related to *S. microphylla*, both maintained by Minod (1918), the latter having most of its features except for leaf shape, flower size and vestiture.

Figure 10. Distribution of *Stemodia trifoliata* (closed circles); *S. veronicoides* (open circles).

SPECIMENS EXAMINED: BRASIL. Espirito Santo: Mpio. de Nova Venecia, Serra de Cima, 15 Nov 1953, *Durante 4031* (RB). Rio de Janeiro: Itatiaia, Maromba, 1000 m, 22 May 1935, *Brade 14660* (MO,LIL,PH,RB); Itatiaia, Nova Picada, 1200 m, 5 Feb 1945, *Brade 17395* (PH,RB); Itatiaia, 17 Feb 1948, *Brade 18861* (RB).

Stemodia verticillata (Miller) Hassler, *Contr. Fl. Chaco.* 110. 1909. BASIONYM: *Erinus verticillatus* Miller, *Gard. Dict.*, ed. 8. 1768. *Stemodia parviflora* W.T. Aiton, *Hortus Kew.* ed. 2. 4:52. 1812 (based upon *Erinus verticillatus* Miller). *Stemodiacra verticillata* (Miller) Kuntze, *Rev. Gen. Pl.* 2:466. 1891. *Lendneria verticillata* (Miller) Britton *in* Britton & Wilson, *Bot. Porto Rico* 6:184. 1925. TYPE: MEXICO. Veracruz: 1731, *Houstoun s.n.* (HOLOTYPE: BM!).

Capraria humilis Solander *in* W.T. Aiton, *Hortus Kew.* ed. 2. 46. 1789. *Lendneria humilis* (Solander) Minod, Bull. Soc. Bot. Genève, ser. 2, 10:241. 1918. *Stemodia humilis* (Solander *in* W.T. Aiton) Dawson, Rev. Mus. La Plata, Sec. Bot. 8:14. 1956. (Not *Stemodia humilis* Pavon *ex* Minod, 1918). TYPE: East Indies, 1781, *Sir Joseph Banks s.n.* (HOLOTYPE: K).

Stemodia arenaria H.B.K., *Nov. Gen. Pl.* 2:357. 1817. TYPE: COLOMBIA. "Crescit in ripa mundata fluminis Magdalenae prope Banco", 1801, *Humboldt & Bonpland s.n.* (LECTOTYPE: P [selected here]).

? *Poarium veronicoides* Desvaux *ex* Hamilton, *Prodr. Pl. Ind. Occ.* 46. 1825. TYPE: DOMINICAN REPUBLIC [Hispañola]: w/o specific locality, w/o date, *Desvaux s.n.* (HOLOTYPE: P).

Stemodia macrotricha Colla, *Herb. Pedem.* 4:327. 1835. TYPE: BRASIL. "Arenosis ad Rio Belmonte", w/o date, *Martins s.n.* (HOLOTYPE: TO).

Herpestris diffusa Willd. *ex* Cham. & Schlecht., Linnaea 3:6. 1878. TYPE: Herb. Willd. 11444 (B-WILLD [Microfiche!]). Cited in synonymy.

Erect or sprawling rather delicate annual herbs 5-25 cm high. Stems variously pubescent with both glandular or eglandular-pilose hairs. Midstem leaves mostly 10-18 mm long, 6-14 mm wide; petioles 5-10 mm long, pilose, grading into the blades; blades ovate, subpalmately nervate, pilose, the surfaces inconspicuously punctate, the margins crenulodentate. Flowers axillary, arranged 2-4 at a node, the pedicels ebracteate, mostly 1-2 mm long. Sepals 5, ± alike, 3-4 mm long, pilose. Corollas 2-3 mm long, blue to purplish, the tubes nearly glabrous, 2-lipped, the lobes ca. 1 mm long, sparsely pubescent.

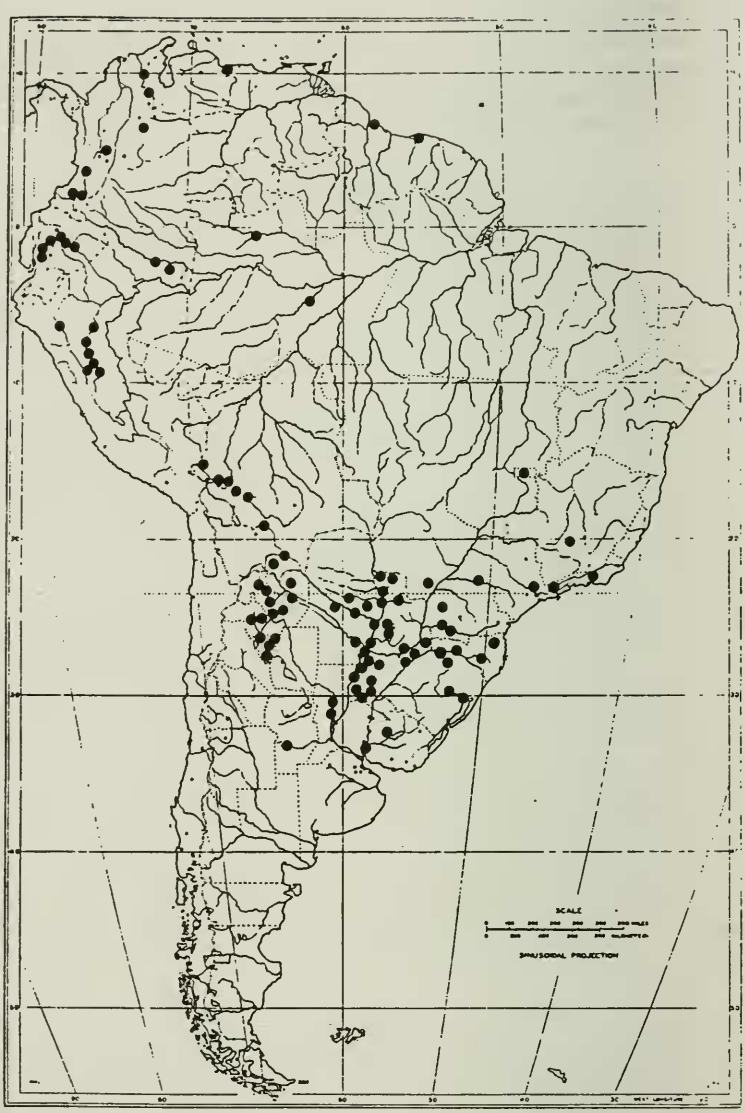

Figure 11. Distribution of *Stemodia verticillata* (closed circles; collections from Galapagos Islands not shown).

Anther thecae glabrous, ca. 0.2 mm long, separated by an enlarged connective ca. 0.3 mm across. Capsules nearly globose, mostly 1.5-2.0 mm high, 2(-4)-valvate, the apices erect. Seeds broadly obpyramidal to ellipsoid, ca. 0.5 mm long, stipitate, longitudinally sulcate with 6-8 ribs. Chromosome number, $2n = 22$.

DISTRIBUTION (Figure 11): Widespread and common weed throughout most of tropical America; flowering all seasons.

This is an easily recognized weedy species. Minod (1918) treated it as the only member of the genus *Lendneria*. Because of the 2000 or more sheets available in many herbaria of this very distinct species we feel no compulsion to provide citations.

EXCLUDED SOUTH AMERICAN NAMES

Stemodia mutisii Fern. Alonso, An. Jard. Bot. Madrid 44:394. 1987. *Darcya mutisii* (Fern. Alonso) B.L. Turner, Phytologia 74:269. 1993.

Stemodia surinamensis Miguel, Linnaea 22:175.. 1849. Minod (1918) could not account for the application of this Surinam name, nor could we. He listed this as a name of uncertain disposition. In addition, Minod lists a number of other *Stemodia* epithets that belong to other genera. These are not repeated here.

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LITERATURE CITED

D'Arcy, W. 1979. *Stemodia*, in Flora of Panama. Ann. Missouri Bot. Gard. 66:252-262.

Dawson, G. 1979. *Stemodia*, in *Fl. Entre Rios* 5:462-471.

Holmgren, N. 1984. *Stemodia*, in *Fl. Ecuador* 21:21.

Minod, M. 1918. Contributions à l'étude du genre *Stemodia* et du groupe des Stemodiees en Amerique. Bull. Soc. Bot. Genève, ser. II, 10:155-252.

Turner, B.L. & C.C. Cowan. 1993. Taxonomic overview of *Stemodia* (Scrophulariaceae) for North America and the West Indies. Phytologia 74:61-103.